Class _____

Book _____

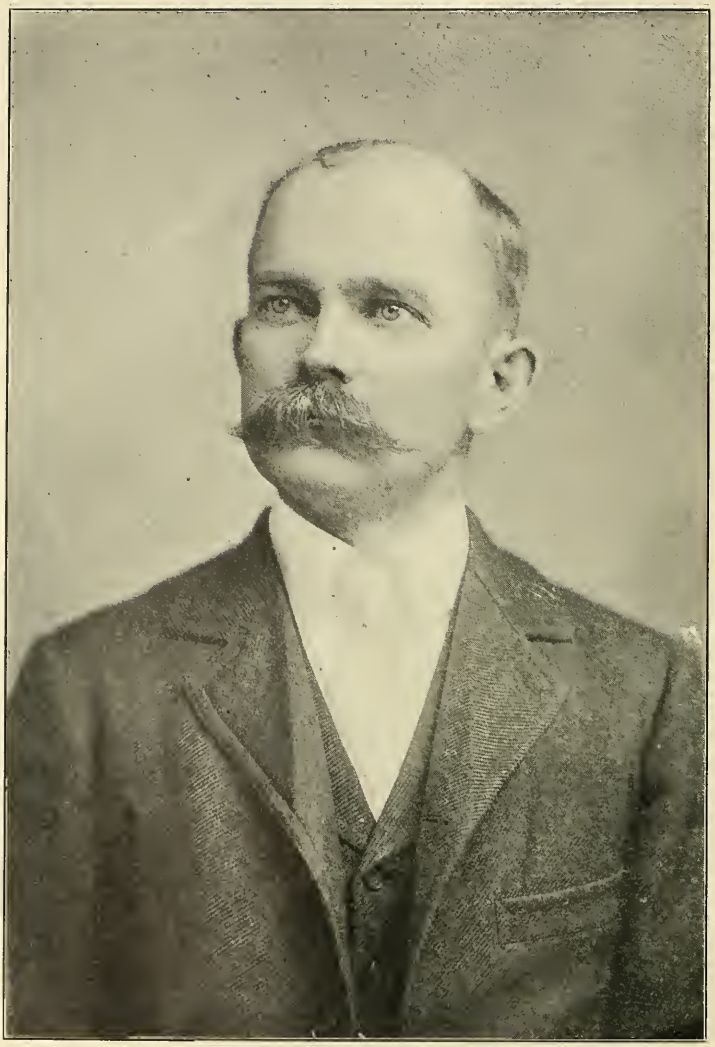
COPYRIGHT DEPOSIT

SCENE IN THE VEGETABLE MARKET, ST. PIERRE, MARTINIQUE

COPYRIGHT, BY J. M. JORDAN, 1898

PICTURESQUE HOUSE, ST. PIERRE, MARTINIQUE

ST. PIERRE, MARTINIQUE, SHOWING MOUNT PELEE IN THE DISTANCE



J. MARTIN MILLER

MEMBER OF THE GEOGRAPIC SOCIETY OF THE UNITED STATES WHO WENT TO MARTINIQUE AS THE GUEST OF THE NAVY DEPARTMENT AT THE REQUEST OF THE PRESIDENT

THE MARTINIQUE HORROR

AND

ST. VINCENT CALAMITY

CONTAINING A

FULL AND COMPLETE ACCOUNT OF THE MOST APPALLING DISASTER OF MODERN TIMES

INCLUDING A

VIVID DESCRIPTION OF THE TERRIBLE VOLCANIC ERUPTIONS; THE DESTRUCTION ST. PIERRE AND OTHER TOWNS AND LOSS OF NEARLY 50,000 LIVES; HEART-RENDING SCENES, ETC.

BY

J. MARTIN MILLER

Member of the Geographic Society of the United States, who went to Martinique as the guest of the Navy Department at the request of the President

In collaboration with HON. JOHN STEVENS DURHAM

Ex-Minister to Hayti

NO SUCH FRIGHTFUL CALAMITY, UNEQUALLED FOR THE SUDDENNESS OF THE BLOW, THE NUMBER OF VICTIMS, THE COMPLETENESS OF THE DESOLATION HAS EVER COME UPON THE CIVILIZED WORLD WITH SUCH OVERWHELMING AND HARROWING FORCE

PROFUSELY EMBELLISHED WITH MANY PHOTOGRAPHS TAKEN BEFORE AND AFTER THE TERRIBLE CALAMITY

NATIONAL PUBLISHING CO.

239-243 SO. AMERICAN ST.

PHILADELPHIA, PA.

F 202
.H6

THE LIBRARY OF
CONGRESS,
TWO COPIES RECEIVED
JUN. 21 1902
COPYRIGHT ENTRY
May 17-1902
CLASS a XXc. No.
33213
COPY B.

ENTERED ACCORDING TO ACT OF CONGRESS, IN THE YEAR 1902, BY
D. Z. HOWELL
IN THE OFFICE OF THE LIBRARIAN OF CONGRESS, AT WASHINGTON, D. C., U. S. A.

PREFACE.

THE appalling catastrophe which visited the Islands of Martinique and St. Vincent, resulting in the destruction of many towns and nearly fifty thousand lives, horrified every part of the world. The heart of humanity shudders at every calamity which results in the sudden death of thousands of people.

Without warning, the terrible volcanic eruption overwhelmed the doomed cities. In the brief space of only a few minutes a large part of the Island of Martinique was turned into an unparalleled scene of devastation. Few persons escaped the horrible fate that swept a vast multitude to sudden death.

Mont Pelée, a great volcano long ago believed to be extinct, suddenly awoke from the sleep of ages. Out of the mouth of the treacherous crater, around which nestled the summer villas and the pretty homes of the wealthy French West Indian residents, suddenly belched forth smoke and flame. Then, like the discharge from a Titanic gun, the volcanic substances leaped thousands of feet into the air and from the awful cauldron's mouth poured down rivers of fire swallowing everything that lay in their path to the sea. Torrents of red-hot ashes and lava burned the country for miles around.

Mont Pelée, which had been quiet for half a century, gave the first indication of its fatal activity on Thursday, May 1, 1902, a week before the great eruption. Strange noises were heard on that day from the region of the mountain. At midnight of May 3, the volcano belched forth volumes of boiling mud. Disturbances were intermittent after that, doing little damage outside a radius of two miles, until Ascension Day, Thursday, May 8. At 7.50 o'clock on the morning of that day the people of St. Pierre heard a terrific explosion from the volcano. A volume of molten metal and lava was thrown off, enveloping the city and all the shipping in the harbor in one mighty flame. Simultaneously the tidal wave swept the roadstead.

With a single blast of the torrent of flame St. Pierre, covering an area of four miles by two, was on fire. By land and sea all was one seething mass of flame. Nothing escaped. Animal and vegetable life was snuffed out in a moment. Seventy-two hours after the disaster thousands of charred bodies were lying dead on the water front.

A relieving party from the French warship Suchet, on the afternoon of Thursday, the day of the disaster, went ashore. Her captain estimated the loss of life at 40,000, incuding Governor Mouttet and wife, the General commanding the troops, and one hundred soldiers, who were armed before the disaster to pacify the panic-stricken people and prevent looting.

Huge trees were torn up by their roots and laid flat, scarce one being left standing, and other indications showed that the wave of fire must have passed over this section of the island at extreme hurricane velocity. Every house in St. Pierre, not excepting those that were most solidly built of stone, is absolutely in ruins. The streets were piled twelve feet high in debris and hundreds of bodies could be seen in every direction.

It is known that many persons who sought refuge in the cathedral perished, but their bodies were scarcely visible, being covered with debris. The sites of the club, the bank, the bourse, the telegraph office and the principal shops—everywhere was the same scene of utter desolation and death.

The Island of St. Vincent was also shaken to its centre by a terrible convulsion of Mont Soufriere. Vast destruction in this island was caused by the raging eruption, and here alone more than two thousand persons lost their lives.

This work depicts the scenes following the deadly eruptions of Mont Pelée and Mont Soufriere, the frantic efforts of the inhabitants to escape their doom, the present appearance of the ruined cities and a full description and history of the Islands of Martinique and St. Vincent. It also narrates the magnificent uprising of people everywhere to afford relief to the survivors of the great catastrophe, including President Roosevelt's message to Congress recommending an appropriation of $500,000 by our Government.

CONTENTS.

INTRODUCTION 17

CHAPTER I.

APPALLING CALAMITY IN THE ISLANDS OF MARTINIQUE AND ST. VINCENT.—TRAGIC DEATH OF MANY THOUSANDS OF PEOPLE.—DESCRIPTION OF THE ISLANDS.—FRIGHTFUL SCENES OF DEVASTATION 65

CHAPTER II.

GRAPHIC ACCOUNTS OF THE GREAT DISASTER.—TRAGEDY COMPLETED IN THE BRIEF SPACE OF A FEW MINUTES.—DESPATCHES FROM UNITED STATES OFFICIALS.—VOLCANIC ISLANDS DESCRIBED.—URGENT APPEALS FOR HELP . . . 82

CHAPTER III.

MARTINIQUE CITY A HEAP OF SMOKING RUINS.—STREETS FILLED WITH CHARRED BODIES.—LARGE PORTIONS OF THE ISLAND ENGULFED WITH LAVA.—ST. VINCENT ALSO DEVASTATED.—RELIEF FOR THE SUFFERERS 100

CHAPTER IV.

AWFUL SCENE IN ST. PIERRE—WHOLE MOUNTAIN APPEARED TO BLOW UP.—SHIPS SWALLOWED BY AN ENORMOUS WAVE.—HARROWING TALES BY EYE-WITNESSES OF THE BURNED CITY 121

CHAPTER V.

PRESIDENT ROOSEVELT'S SPECIAL MESSAGE TO CONGRESS.—LARGE APPROPRIATION BY OUR GOVERNMENT FOR IMMEDIATE RELIEF OF THE SURVIVORS.—ADDITIONAL DETAILS OF THE TERRIBLE CALAMITY.—SCENES BAFFLING DESCRIPTION 139

CHAPTER VI.

PAGE.

TWO THOUSAND PERSONS KILLED IN ST. VINCENT. — GREAT ALARM AS TO THE FATE OF THE ISLAND.—AWFUL SUDDENNESS OF THE CALAMITY AT ST. PIERRE.—GRAPHIC STORIES TOLD BY WITNESSES OF THE DEADLY EXPLOSION 157

CHAPTER VII.

NARRATIVES OF PERSONAL EXPERIENCES.—TOURIST PORTRAYS MONT PELEE. — STORMY HISTORY OF MARTINIQUE. — GRAPHIC LETTER FROM A CONSUL'S WIFE.—GREAT DISASTERS FROM VOLCANIC ERUPTIONS. — SCENES IN THE STRICKEN ISLANDS 179

CHAPTER VIII.

ST. VINCENT VOLCANO IN ACTIVE ERUPTION.—TERRIFIC CANNONADE HEARD ONE HUNDRED MILES AWAY. — KINGSTOWN SHOWERED WITH HOT ASHES AND PEBBLES . . . 203

CHAPTER IX.

FOR WEEKS MONT PELEE BELCHED CLOUDS OF SMOKE.—SPLENDID AND APPALLING PHENOMENON.—INCESSANT ROAR OF AWFUL THUNDER. — TERRORS PARALYZE THE HELPLESS INHABITANTS 221

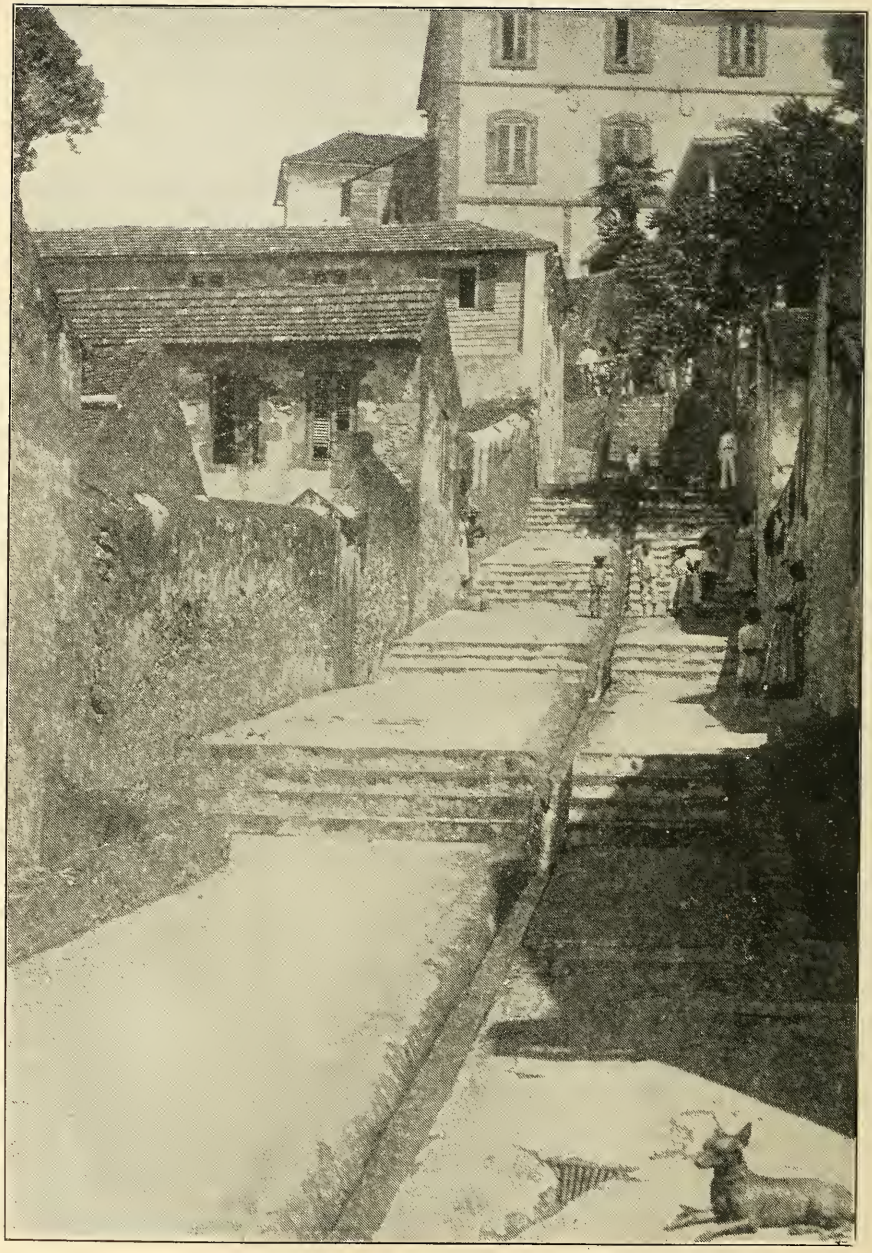
CHAPTER X.

NEW HORRORS REVEALED DAILY. — MONT PELEE AGAIN IN ACTIVE ERUPTION.—RIVERS AND LAKES DRIED UP.—HISSING PITS OF LAVA.—PHYSICAL CHANGES MADE BY THE OUTBREAKS 239

CHAPTER XI.

SHIP TOSSED BY GIANT WAVES WITHOUT A BREATH OF WIND. — STORY OF THE CAPTAIN OF A DANISH VESSEL. LONG HOURS OF TERROR ENDURED BY THE CREW.—WRECK OF THE SHIP RODDAM 264

LIGHT HOUSE AT ST. PIERRE, MARTINIQUE



A PICTURESQUE STREET, ST. PIERRE, MARTINIQUE

GOVERNOR'S PALACE, ISLAND OF MARTINIQUE

THE NATIVE QUARTERS, ST. PIERRE, MARTINIQUE

AGE.

CHAPTER XII.

MARTINIQUE UNDER A MANTLE OF DARKNESS.—LIFE ON THE ISLAND ALMOST UNENDURABLE. — EXTREME SUFFERINGS OF THE REFUGEES. — FAMINE AND DISEASE RAVAGING ST. VINCENT 289

CHAPTER XIII.

CONTINUED PANIC AT MARTINIQUE. — MONT PELEE AGAIN IN ERUPTION.—THRILLING ESCAPE OF A PARTY OF AMERICAN SAILORS. — HUNDREDS OF BODIES AFLOAT IN THE SEA . 305

CHAPTER XIV.

TERRIBLE PANIC FOLLOWS FRESH OUTBREAK OF MONT PELEE. FRANTIC EFFORTS TO ESCAPE TO THE SHIPS AT FORT-DE-FRANCE.—MANY RESCUED FROM UNDER THE SHADOW OF THE DEATH-DEALING MOUNTAIN 329

CHAPTER XV.

WOMEN AND CHILDREN HEMMED IN BY TIDE OF LAVA.—FACE TO FACE WITH A TERRIBLE DOOM.—EXPEDITION TO MONT PELEE.—CHILD'S PATHETIC TALE 347

CHAPTER XVI.

NORTH AMERICAN VOLCANOES. — FAMOUS MOUNT SHASTA.— NORTHERN ARIZONA.—VOLCANIC GLASS.—CRATERS ON THE PACIFIC COAST 366

CHAPTER XVII.

RIDGE OF PANAMA AND THE ANDES.—THE GREAT CANYON.— CALIFORNIA AND UTAH.—YELLOWSTONE PARK.—MEXICO AND SOUTH AMERICA 383

CHAPTER XVIII.

AMAZING PHENOMENA CONNECTED WITH VOLCANOES AND EARTHQUAKES. — FIERY EXPLOSIONS AND MOUNTAINS IN CONVULSIONS.—CHANGES IN THE SURFACE OF THE EARTH. 401

PAGE

CHAPTER XIX.

GREAT VOLCANIC ERUPTIONS IN MANY PARTS OF THE WORLD. STORY OF MT. ETNA. — CONVULSIONS IN SOUTH AMERICA AND ELSEWHERE 419

CHAPTER XX.

ERUPTION OF ETNA IN THE YEAR 1865.—MUTUAL DEPENDENCE OF ALL TERRESTRIAL PHENOMENA.—SEA COAST LINE OF VOLCANOES.—THE PACIFIC "CIRCLE OF FIRE." 438

CHAPTER XXI.

TORRENTS OF STEAM ESCAPING FROM CRATERS.—GASES PRODUCED BY THE DECOMPOSITION OF SEA-WATER.—HYPOTHESES AS TO THE ORIGIN OF ERUPTION. — GROWTH OF VOLCANOES 457

CHAPTER XXII.

VARIOUS KINDS OF LAVA.—BEAUTIFUL CAVE IN SCOTLAND.—CREVICES IN VOLCANOES.—SNOW UNDER BURNING DUST . 477

CHAPTER XXIII.

VOLCANIC PROJECTILES. — EXPLOSIONS OF ASHES. — SUBORDINATE VOLCANOES. — MOUNTAINS REDUCED TO DUST.—FLASHES AND FLAMES PROCEEDING FROM VOLCANOES . . 493

CHAPTER XXIV.

VOLCANIC THERMAL SPRINGS. — GEYSERS. — SPRINGS IN NEW ZEALAND.—CRATERS OF CARBONIC ACID 507

APPENDIX.

DEATH CAME TO EVERYONE IN ST. PIERRE WITH THE QUICKNESS OF A CANNON SHOT.—SULPHUROUS GAS PERMEATED EVERY PLACE AND WAS EXPLODED AT ONCE.—PRIESTS' BODIES FOUND IN THE ATTITUDE OF PRAYER.—CALM, NOT PANIC, WRITTEN ON THE LINES OF DEAD FACES.—DARING FEAT OF PROFESSOR HEILPRIN IN ASCENDING MOUNT PELEE AFTER THE ERUPTION 513

INTRODUCTION.

ON MAY 9th the civilized world was shocked by meagre telegraphic reports to the effect that the City of St. Pierre of Martinique, a French possession in the West Indies, had been destroyed by a sudden eruption of the volcano Mont Pelée. Cable communications with all the neighboring islands had been interrupted by the terrible upheaval accompanying the eruption.

On the morning of May 10, the horrible news was confirmed with the additional reports that the shipping in the harbor had been destroyed and that the loss of life was estimated at 25,000 souls.

On May 11th, the American public began to receive detailed reports, showing that the entire top of the mountain had been blown off and that probably 40,000 persons had perished. Boiling mud, carrying molten stone and exhaling inflammable gases, had fallen upon the City of St. Pierre like a great blanket of death, and had destroyed the entire community within the space of three minutes. There had been no time for panic. One moment of agony and all was over.

On May 12th, the cable service had been very much improved and the additional news was received that Soufriére, a volcano on the neighboring island of St. Vincent, a British possession, was active; that neighboring islands were feeling the tremors, and that the entire group of the Lesser Antilles were in a state of panic.

President Roosevelt, with his splendid judgment and magnificent enthusiasm laid before Congress immediately in a special

message the demands of the stricken community upon our neighborly sympathy and by his direction government vessels were loaded with supplies.

Thirty-six hours after the first report of the calamity the Senate passed a bill appropriating $100,000 as a nucleus of the relief fund. An objection in the House caused a delay of from Saturday to Monday; but Congress promptly rebuked the objector by doubling the amount of appropriation and sending it back to the Senate where the amount of $200,000 was promptly confirmed and sent back to the President for his approval. The amount was later increased to $500,000.

HOW EXPLOSIONS OCCUR.

Professor MILNE, of Chicago, one of the greatest authorities in the world on volcanic phenomena, divides eruptions into two classes:

Those that build up slowly.

Those that destroy most rapidly.

"The latter," he says, "are the most dangerous to human life and the physical face of a country. Eruptions that build up mountains are periodical wellings over of molten lava, comparatively harmless. But in this building up, which may cover a period of centuries, natural volcanic vents are closed up, and gases and blazing fires accumulate beneath that must eventually find vent. Sooner or later they must burst forth, and then the terrific disasters of the second class take place. It is the same cause that makes a boiler burst."

Professor Amos P. Brown, of the University of Pennsylvania, gives a very interesting description showing that Martinique was formed into an island by eruptions of Mount Pelée ages ago, and that the same forces of nature which forced up the land above the surface of the ocean finally destroyed the island. The distance

from the volcano to the sea is three miles and to the town it is about five miles. Several hills and ravines are spread between the town and mountains, which, had the explosion occurred in the cone, would have partly saved the former.

HOW THE MOUNTAIN BLEW UP.

The vast fields of hot lava which were boiling in the base of Pelée for years were acted upon by an inlet of water. This, no doubt, came through a crevice from the sea. The French Cable Company reported nearly a fortnight before that the sea floor near St. Pierre, Martinique, had dropped over 1000 feet. A break in the earth's crust resulted. Through this the sea rushed in. Coming in contact with the lava bed and an immense amount of steam was generated.

"Soon it became heated to an intensity of five or six tons pressure to the square inch. It is almost impossible to conceive its latent force. The area which confined it could not hold the increasing volume. It sought an outlet. The cap over the summit of the crater proved too strong. It attacked the weakest side which was adjacent to the town. This side of the mountain was unable to withstand the strain and blew out. As long as it takes a projectile to shoot through the air and drop to earth just so long it took the fierce, red hot stream of molten rock and sheets of flame to fall upon the town. The consequent igniting of St. Pierre must have generated poisonous gases that resulted in the death of many victims. The inhalation of the hot air was instantly fatal. If the path of destruction is anything like that of other great volcanic disturbances, no vegetable or animal life can survive them for a minute."

It is quite certain that the people in the vicinity were warned in sufficient time to have escaped. More than a week before there was a flow of lava from a crevice near the summit. This stream

was carried to the sea through a deep ravine that intervened between Pelée and St. Pierre. Had it not been for this outlet the lava would in all probability have flowed down to the town. Previous to this eruption there were violent tremblings of the earth, and more or less earthquakes. Such manifestations usually precede the tragic climax of a volcano in full action.

THE MODERN POMPEII.

St. Pierre, Martinique, the modern Pompeii, was the largest town, and the commercial center of the French West Indies, being well built and prosperous. Its population was about 25,000. The city was divided into two parts, known as the upper and lower towns. The lower town was compact, with narrow streets, and unhealthy. The upper town was cleaner, healthier and handsomely laid out. There was in the upper town a fine botanical garden and an old Catholic college, as well as a fine hospital.

The Consuls resident at St. Pierre were: For the United States, T. T. Prentis; Great Britain, J. Japp; Denmark, M. E. S. Meyer; Italy, P. Pliosonneau; Mexico, E. Dupre; Sweden and Norway, Gustave Borde.

There were four banks in the city—the Banque de la Martinique, Banque Transatlantique, Colonial Bank of London and Credit Foncier Colonial.

CHARACTERISTICS OF THE ISLAND.

The Island of Martinique has the same general characteristics as its nearest neighbors, with some peculiarities of its own. Its extreme length is about forty-five miles from northwest to southeast, and the main part of it is in the shape of an oval, with rough edges, its greatest width being fifteen miles. At the lower end of this main part the old Fort Royal Bay—since the French Revolution called Fort-de-France Bay—cuts in so deep as

to come within six miles of meeting the inlets of Le Robert and Le Francais on the other side.

The whole area of the island, near 400 square miles, is mountainous. Besides Mount Pelée, there are further south and about midway of the oval the three crests of Courbet, and all along the great ridge are the black and ragged cones of old volcanoes.

SAVAGE VOLCANIC SCENERY.

The mountainous interior is torn and gashed with ancient earthquake upheavals, and there are perpendicular cliffs, deep clefts and gorges, black holes filled with water and swift torrents dashing over precipices and falling into caverns—in a word, all the fantastic savagery of volcanic scenery, but the whole covered with the rich verdure of the tropics.

The total population of the island is reckoned at 175,000, of whom 10,000 are whites, 15,000 of Asiatic origin, and 150,000 blacks of all shades, from ebony to light octoroon.

Martinique had two interesting claims to distinction in that the Empress Josephine was born there, as was Mme. De Maintenon, the latter passing her girlhood on the island as Francoise d'Abigne. At Fort-de-France there is a marble statue of the Empress Josephine.

Martinique became an interesting point in this country during the recent war with Spain. The first news of the arrival of the Spanish fleet of Admiral Cervera came to St. Pierre. At 9.30 o'clock on the morning of May 11, 1898, the cruiser Harvard arrived at St. Pierre, and at 6 o'clock the same evening a correspondent at Fort-de-France communicated to the Harvard's commander the fact that the Spanish torpedo boat destroyer Furor had put into Fort-de-France. The destroyer turned out to be the Terror instead of the Furor, but the important fact that Cervera was on this side of the ocean was established.

From the beginning of history the habitations of men have been leveled or buried by earthquake shocks and volcanic eruptions, and the numbers of human beings killed in this way passes comprehension.

OVERWHELMED FORTY-TWO VILLAGES.

One of the most frightful explosions of modern times was that of Asama of Japan, in 1883. It sent down 8000 feet a torrent of mud and fire from five to ten miles broad that overwhelmed forty-two villages. Historians have never been able to determine how many lives were actually lost by this explosion. The total ran into the thousands.

On July 15, 1888, Bandaisan, Japan, blew up, and sent 16,000,000 cubic yards of rock and earth into the valley beneath. The lava stream from its head traveled at the rate of 48 miles an hour and was 100 feet deep. Its width ran from five to fifteen miles. But only 401 persons lost their lives.

FLAMES SEEN FOR FORTY MILES.

On an island in the Strait of Sunda, between Java and Sumatra, occurred the greatest explosion ever known of Krakatoa. On May 20, 1883, the eruption commenced, but the great explosion did not come until August 26 of that year. The flames from the crater could be seen forty miles distant. The crashing explosion which followed these flames set in motion air waves that traveled around the earth four times one way and three times the other. Every self-recording barometer in the world was disturbed seven times by that blow-up. These waves traveled at the rate of 700 miles an hour. At Borneo, 1116 miles distant, the noise of this eruption was heard. It was felt in Burmah, 1478 miles distant, and at Perth, West Australia, 1902 miles distant. The Krakatoa explosion was heard over a

sound zone covering one-thirteenth of the earth's surface. Sea waves were created by the explosion, which

Destroyed two lighthouses in the Strait of Sunda.

Destroyed all the towns and villages on the shores of Java and Sumatra bordering the strait.

Destroyed all vessels and shipping there.

Killed 36,380 people.

Raised a tidal wave at Merak 135 feet high.

Covered 500,000 square miles of ocean with lava dust several inches thick.

Submerged an island six miles square and 700 feet high in depth of water of 150 fathoms.

Created two new islands.

THE MOST DISASTROUS EARTHQUAKES IN HISTORY.

The most disastrous earthquake of recent history was the great Lisbon shock, on November 1, 1755. In less than eight minutes almost all the houses of Lisbon were overturned, 50,000 of the inhabitants were killed, and whole streets were buried. The cities of Coimbra, Oporto, Braga and St. Ubes were destroyed Malaga, in Spain, was largely reduced to ruins. One-half of Fez, in Morocco, was destroyed, and 12,000 Arabs killed. The island of Madeira was laid waste, and the ruin extended to Mitylene in the archipelago, where half the town was laid low.

Following is a list of the principal earthquakes of history:

345 B. C.—Twelve cities in the Campana buried and Duras, in Greece, destroyed, with immense loss of life.

283 B. C.—Lysimicahie and its inhabitants buried.

79 A. D.—Pompeii and Herculaneum destroyed.

106 A. D.—Four cities in Asia, two in Greece, two in Galatia destroyed.

157 A. D.—One hundred and fifty cities in Asia, Pontus and Macedonia buried.

557 A. D.—Constantinople partly destroyed, thousands perish.

742 A. D.—One hundred cities in Asia, Syria and Palestine overturned; immense loss of life.

936 A. D.—Constantinople again destoyed. All Greece shaken.

1089 A. D.—England thoroughly shaken.

1137 A. D.—Cautania, Sicily, destroyed; 15,000 lives lost.

1158 A. D.—In Syria, 20,000 lives lost.

1268 A. D.—In Cilicia, 60,000 perished.

1318 A. D.—In England; greatest known there.

1456—December 5, 40,000 perished at Naples.

1531, February 26.—Lisbon, 1500 houses and 30,000 persons killed; several neighboring towns swallowed up in the sea.

1580, April 6.—St. Paul's, London, partly destroyed.

1596.—Japan cities destroyed and thousands perished.

1626, July 30.—At Naples, thirty towns destroyed, 70,000 lives lost.

1667, April 6.—At Schamaki, 80,000 died.

1692, June 7.—At Jamaica, 3000 killed.

1603, September.—In Sicily, 100,000 lives lost.

1703—Medod, Japan, 200,000 dead.

1706.—Abruzzi, Italy, 15,000 perished.

1716, May.—Algiers, more than 20,000 lost.

1731, November 30.—One hundred thousand people buried at Pekin.

1732.—Naples, 1940 lives lost.

1746, October 28.—Lima, Peru, and Callao destroyed; 18,000 persons buried.

1751, November 21.—Santa Domingo overwhelmed; immense loss of life.

1754, September.—Cairo, loss of 40,000 lives.

745, June 7.—Kaschan, Persia, overturned; 40,000 people killed.

1755, November 1.—Great Lisbon shock; 50,000 people killed at Lisbon; 12,000 Arabs in Morocco buried, 2000 houses in the Grecian archipelago overturned.

1759, October 30.—Baalbec, Syria, destroyed; 20,000 persons killed.

1773, June 7.—Santiago, Guatemala, and its inhabitants swallowed up.

1783, February 4.—Towns in Italy and Sicily destroyed; thousands perish.

1784, July 23.—Ezinghian, near Erzeroum, destroyed; 5000 killed.

1788, October 12.—St. Lucia, near Martinique; 900 killed.

1797, February 4.—Panama; 40,000 people buried suddenly.

1800-1842.—Great shocks, with awful loss of life, in Constantinople, Holland, Naples, the Azores, the Mississippi Valley, Caracas, India, Genoa, Aleppo, Chile, Spain, China, Martinique and Guadaloupe.

1868, August 13.—Cities in Equador destroyed; 25,000 killed and property loss $300,000,000.

1883, August 3.—Island of Ischia almost destroyed; 2000 lives lost.

1883, October 20.—Krakatoa eruption in Java and Sumatra; 100,000 lives lost.

1884, April 22.—Earthquake general throughout England.

1886, August 31.—Charleston, S. C.; 41 lives lost, $5,000,000 property destroyed.

THE FIRST SHOCK OF HORROR.

The first acceptable report of the calamity came by telegraph from St. Thomas, and was printed throughout the United States

on the morning of May 9th. It announced that the city of St. Pierre, the principal port of the French Island of Martinique, was destroyed, with all its inhabitants, at 8 o'clock on the morning of May 8th by a flow of lava from the volcano Mount Pelée. The number of lives lost was believed to exceed 25,000, and may be as great as 40,000.

The whole top of the mountain was reported to have blown off. For three minutes lava and ashes poured down upon the doomed city. The panic-stricken population fled to the waterside, but in vain. Eighteen ships in the harbor were destroyed by molten lava, and the people who fled to the wharves were soon caught in the awful flood and consumed.

STEAMERS THAT ESCAPED.

All the suburbs within a radius of four miles were destroyed. Cable communication with the island, as well as with the islands of St. Vincent, Barbadoes, Grenada, Trinidad and Demerara was interrupted. Steamers that escaped from the vicinity during the eruption reported the losses as follows:

City of St. Pierre and suburbs, with from 25,000 to 40,000 inhabitants.

Steamer Roraima, belonging to the Quebec Steamship Company, with thirty-five sailors from New York city and three West Indian passengers, F. Ince, Mrs. H. J. Ince and Mrs. H. J. Stokes.

Seventeen sailors of the British steamer Roddam, which, by slipping her anchor, escaped from the harbor at the time the city was overwhelmed.

Steamer Grappler, cable repair ship of the West Indian and Panama Telegraph Company, and all on board.

Governor M. L. Mouttet, of the Island of Martinique, and his staff colonel and wife.

Thomas T. Prentiss, of Michigan, United States consul.

Amedee Testart, of Louisiana, United States Vice Consul.
J. Japp, British Consul.
M. E. S. Meyer, Danish Consul.
P. Pliosonneau, Italian Consul.
E. Dupre, Mexican Consul.
Gustave Borde, Swedish Consul.
Sixteen steamers, names and nationalities unknown.

SURVIVORS NUMBER THIRTY.

So far as known only thirty persons were believed to have survived of all those who were at St. Pierre at the time. These were taken by the French cruiser Suchet to Fort-de-France. The commander of the cruiser reports that by one o'clock on Thursday the entire town of St. Pierre was wrapped in flames. He endeavored to save about thirty persons more or less burned from vessels in the harbor. His officers went ashore in small boats seeking for survivors, but were unable to penetrate the town. They saw heaps of bodies upon the wharves, and it is believed that not a single person in the town at the time escaped.

The only vessel to escape from the harbor was the British steamer Roddam, which arrived at St. Lucia the following day. She got out of the harbor by slipping her cables, but lost seventeen men. Her captain was very seriously injured, and was placed in the hospital at St. Lucia. All of his officers and engineers were dead or dying. Nearly every member of the crew is dead. Supercargo Campbell and ten of the crew of the Roddam jumped overboard at St. Pierre and were lost.

Of the eighteen vessels destroyed in the harbor three are said to have been Americans.

The Quebec Steamship Company's steamer Roraima was among those destroyed. Some of the survivors declare she exploded. Others say that she was wrecked in a terrible upheaval

of land and sea. All of her crew, including thirty-five members from New York, were lost. Eight of her passengers were among the persons saved by the French cruiser Suchet.

The British schooner Ocean Traveler, of St. John, N. B., arrived at the Island of Dominica at 3 o'clock in the afternoon. She reported having been obliged to flee from the Island of St. Vincent, British West Indies, during the afternoon of Wednesday, May 7, in consequence of a heavy fall of sand from a volcano which was erupting there. She tried to reach the Island of St. Lucia, British West Indies, but adverse currents prevented her from so doing.

The schooner arrived opposite St. Pierre on Thursday morning, May 8. While about a mile off the volcano—Mount Pelée—exploded, and fire from it swept the whole town of St. Pierre, destroying the town and the shipping there, including the cable repair ship Grappler, of the West India and Panama Telegraph Company, of London, which was engaged in repairing the cable near the Guerin factory.

The Ocean Traveler, while on her way to Dominica, encountered a quantity of wreckage.

COULD NOT APPROACH THE TOWN.

The British royal mail steamer Esk, which arrived at St. Lucia, May 9, reports having passed St. Pierre the night previous. The steamer was covered with ashes, though she was five miles distant from the town, which was in impenetrable darkness. A boat was sent in as near as possible to the shore, but not a living soul was seen ashore, only flames.

On May 9, the commander of the French cruiser Suchet telegraphed to Paris to the Minister of Marine, M. de Lanessan, from Fort-de-France, Island of Martinique, under date of Thursday, May 8, at 10 P. M., as follows :

"Have just returned from St. Pierre, which has been completely destroyed by an immense mass of fire, which fell on the town at about 8 in the morning. The entire population (about 25,000 souls) is supposed to have perished. I have brought back the few survivors, about thirty. All the shipping in the harbor has been destroyed by fire. The eruption continues.

"The commander of the Suchet has been ordered to return to St. Pierre, Martinique, with all the speed possible, and to forward details of the disaster to the French Government. He cannot, however, be heard from for twenty-four hours, as the Suchet has gone to the island of Guadeloupe in order to obtain provisions.

"It was feared that M. L. Mouttet, the Governor of Martinique, has perished. He telegraphed May 7 that he was proceeding to St. Pierre. Senator Knight is also supposed to have been at St. Pierre."

"M. Bouguenot, a sugar planter of the Island of Martinique, received a cable dispatch this morning from Fort-de-France, sent by the manager of the Francais factory, announcing that he had 'tried to reach St. Pierre, but found the coast covered with ashes and the town enveloped in dust, and could not land.'"

VESSELS HURRIED TO THE RESCUE.

The Colonial Minister, M. Decrais, received at 6 o'clock the same evening two cable messages from the Secretary General of the Government of Martinique, J. F. G. L'heurre, sent respectively at 5 P. M. and 10.30 P. M., May 9. The earlier cable reported that the wires were broken between Fort-de-France and St. Pierre, but it was added, in view of reports that the eruption of Mount Pelée had wiped out the town of St. Pierre, all the boats available at Fort-de-France were dispatched to the assistance of the inhabitants of that place.

The second dispatch confirmed the reports of the destruction

of St. Pierre and its environs and shipping by a rain of fire, and said it was supposed that the whole population had been annihilated with the exception of a few injured persons rescued by the cruiser Suchet.

Immediately after the receipt of the above dispatches the flag over the Colonial Office was draped with crape and hoisted at half-mast.

OUR GOVERNMENT ADVISED. CONSUL REPORTED LOST.

On the morning of May 9, the following cablegram was received at the State Department: "Pointe-A-Pitre, May 9,—Secretary of State, Washington: At 7 o'clock A. M. on 8th inst., a storm of steam, mud and fire enveloped the city and community. Not more than twenty persons escaped with their lives. Eighteen vessels were burned and sunk with all on board, including four American vessels and a steamer from Quebec named Roraima. The United States Consul and family are reported among the victims. A war vessel has come to Guadeloupe for provisions and will leave here to-morrow.

"AYME, Consul."

The State Department has been receiving dispatches from commercial houses in New York, asking that a warship be sent at once to Martinique to afford relief.

The consul at Martinique is Thomas T. Prentis. He was born in Michigan and was appointed from Massachusetts as Consul at Seychelles Islands, in 1871, and later served as Consul at Port Louis, Mauritius; Rouen, France, and Batavia. He was appointed Consul in Martinique at 1900. The Vice Consul at Martinique is Amedee Testart, who was born and appointed from Louisiana in 1898.

The latest available figures showed that the total population of the island of Martinique is 185,000 people, of whom 25,000

lived in St. Pierre, and, according to Mr. Ayme, had nearly all perished.

A dispatch to the Reuter Telegram Company from Kingston, Jamaica, to London, after giving the details of the Martinique disaster already known, said:

"Thousands were killed at St. Pierre, where a terrible panic prevailed. The eruption began Saturday, May 3, when St. Pierre was covered with ashes and appeared to be enveloped in fog. The flow of lava continued until Wednesday, May 7.

"In the Island of St. Vincent the Soufriere (volcano) is active and earthquakes are frequent.

In response to the request of Governor Llewellyn, of the Windward Islands, the British second-class cruiser Indefatigable was dispatched from the Island of Trinidad to the Island of St. Vincent, by way of St. Lucia.

OUR GOVERNMENT PROMPT TO AID.

With an unselfishness and spontaneity that had impressed the representatives of foreign governments in Washington, the United States immediately took measures for the relief of the sufferers from the disaster in Martinique. The cruiser Cincinnati was ordered to proceed to the island without delay, to investigate and report upon the situation and extend aid to the survivors. The ocean tug Potomac was on her way from the naval station at San Juan, a few hours after the news reached our new possession of Porto Rico. The training ship Dixie was ordered to prepare for sea and sent to Fort-de-France.

The action of the administration was indorsed and supplemented by the Senate, which passed immediately a bill appropriating $100,000 for the relief of the distressed inhabitants of Martinique. This bill would have gone through the House with the same

impressive promptness as in the Senate had it not been for the objection of Representative Oscar W. Underwood, of Alabama. Mr. Underwood expressed the opinion that Congress should await the receipt of "official details," and it was not possible for the House to act until two days later, when the measure was to be taken up and passed.

Sunday was an anxious day for the government. The President took great interest in the disaster, but the State Department was unable to furnish him with any information. Consul Ayme, at Guadeloupe, suggested that he be permitted to proceed to Martinique, and Secretary Hay cabled this permission at once. He sailed on the French man-of-war Suchet, which was carrying supplies to the destitute.

CRUISER SENT TO ISLAND.

The State Department having been notified late Sunday afternoon that the situation in Santo Domingo was more orderly Assistant Secretary of State Hill called upon Secretary of the Navy Moody, and suggested that the cruiser Cincinnati be directed to proceed to Martinique. Secretary Moody had earlier in the day indicated to Captain Yeats Stirling, commandant of the naval station at San Juan, that he might send the ocean tug Potomac to Fort-de-France. The orders cabled by Secretary Moody to Commander T. C. McLean, of the Cincinnati, read :

"Proceed Martinique. Render such assistance as possible. Use your discretion. Report by cable when practicable. Correspondents of American newspapers can go if you are willing."

Secretary Moody estimated that the Cincinnati could cover the six hundred miles separating Santo Domingo and Martinique within forty-eight hours. This would necessitate the Cincinnati steaming at a constant speed of between twelve and thirteen knots an hour.

The action of the Senate upon the bill for the relief of the sufferers of Martinique earned for that body the warmest praise of officials and diplomats. Senator Fairbanks, of Indiana, offered the bill, which appropriated $100,000 and authorized the President to expend it in the "purchase of such provisions, clothing, medicines and other necessaries as he shall deem advisable, and tender the same, in the name of the government of the United States, to the government of France for the relief of citizens who have suffered by the late earthquake in the islands of the French West Indies." The bill authorized the Secretary of War to use the necessary steamships belonging to the United States to carry its purpose into effect.

Senator Fairbanks requested immediate consideration of the measure.

APPEAL FOR THE ISLANDERS.

"Let the United States lead in the act of caring for the stricken," said Mr. Fairbanks. "She and her people never have failed yet to be moved by the cry of distress which has come up from other lands. Let us extend our sympathy for our unfortunate fellow men and send with it from our abundant stores the means necessary to succor those upon whom has fallen a sudden and overwhelming calamity.

"I believe that in tendering our sympathy and assistance we shall but interpret the wishes and purposes of the humane, generous American people."

The Senate unanimously passed the bill, which was taken at once to the House, where Mr. Underwood blocked its further progress.

"There is no occasion," Mr. Underwood said, "for a legislative spasm. The reports of the situation in Martinique may be exaggerated. Some official report should be received before action is taken."

Representative Payne, of New York, urged upon Mr. Underwood to withdraw his objection. He pointed out that it was necessary to act at once. Mr. Underwood persisted, however, and the bill, under the rules, had to go over without action until the following Monday.

FRANCE APPRECIATES OUR HUMANITY AND FRIENDSHIP.

On Saturday evening, May 9th, M. Cambon, French Ambassador, gave out this statement:

"The Ambassador of France is very sensible to the very generous initiation of the Senate, which, upon Senator Fairbanks' motion, passed this afternoon the bill for the relief of the sufferers of poor Martinique.

"The government of France has announced that supplies will be dispatched to the distressed islanders, but the distance prevents their reaching their destination in time for immediate distribution. Consequently, the action taken by the Senate and the issuance by the Navy Department of orders to the Cincinnati to proceed to Martinique and give assistance to the needy survivors, can be of incalculable benefit.

"France cannot but greatly appreciate the feeling of humanity and friendship which prompted this generous offering to her suffering citizens."

RELIEF SHIPS DART FROM ALL POINTS TO SUCCOR.

From half a dozen neighboring islands and from Fort-de-France ships rushed to the relief of St. Pierre, prepared to succor the survivors of the stricken city if any were left to tell the tale.

Fort-de-France, the capital, is only twelve miles away by water, and the ships which were hurried to the scene should have reached there within an hour from their departure. At Fort-de-France is the finest land-locked harbor in the Windward Islands,

with a huge dry dock, and there are always many big ships there. Officials of the island lost no time in dispatching vessels to the destroyed town, and within a few hours after the catastrophe relief ships were lying off the doomed town.

From Guadeloupe, St. Lucia, St. Vincent and Dominica, St. Thomas and Porto Rico relief expeditions were sent.

Speculation was now most anxious as to the fate of neighboring villages and islands. Harry J. Tifft, of Middleton & Company, West Indies traders, of New York, who spent several years at St. Pierre, and whose wife is a native, said that the nearness of St. Pierre to many other points in the Windward Islands ought to insure speedy relief and early accounts of the disaster.

Said Mr. Tifft: "There are five villages with a total population of over 12,000 within the circle of destruction. Some of these are much nearer the volcano's crater than was St. Pierre. The village of Morne Rouge, a place of about 3500 people, is on the ridge of the mountain, just below the crater. It is the home of the rich plantation owners and merchants of the district.

THE SURROUNDING VILLAGES.

"Lying along the coast, directly to the north of St. Pierre, and right under the shadow of Mont Pelée, are the villages of Precheur, with over 4000 people; Ste. Philomene and Fonds Canonuille. To the south, close at hand, is the village of Carbet. Back inland, but only a short distance from Mont Pelée is the village of Fonds St. Denis.

"There is a population of over 40,000 within a circle drawn at a radius of four miles around Mont Pelée. Certainly all who could must have fled before the explosion of the crater on Thursday morning.

"The whole island of Martinique is thickly populated and the inland country is filled with people. These get their

provisions mainly from St. Pierre, and with the destruction of the town there must be serious trouble, if not actual famine, among the people.

"St. Pierre was the chief commercial town, not only of the island, but of the several islands close about. Fort-de-France is not a commercial point of any note. It has a few mercantile establishments, and the chief importance is the fact that the Government is situated there.

MOUNTAIN WAS NOT FEARED.

"When I lived at St. Pierre no one ever thought of having the least fear of Mont Pelée. During the eight years I was there there was never the slightest smoking or any other indication that it was active. This long inactivity made the people feel secure, and perhaps when it began to smoke recently they considered it as no more serious than the harmless eruption in 1851, and remained at their homes."

Still the friends of Consul Prentiss and his family led the American public to hope for the safety of the officer. Relatives lived at Melrose, Massachusetts. They had received a letter from Mrs. Prentiss dated April 25, thirteen days before the eruption.

In this letter Mrs. Prentiss said:

"This morning the whole population of the city is on the alert and every eye is directed toward Mt. Pelée, an extinct volcano. Everybody is afraid that the volcano has taken into its heart to burst forth and destroy the whole island. Fifty years ago Mt. Pelée burst forth with terrific force and destroyed everything for a radius of several miles.

"For several days the mountain has been bursting forth, and immense quantities of lava are flowing down the sides of the mountain. All the inhabitants are going up to see it.

"There is not a horse to be had on the island; those belonging to the natives are kept in readiness to leave at a moment's notice. Last Wednesday, April 23, I was in my room with little Christine, and we heard three distinct shocks. They were so great that we supposed at first that there was someone at the door, and Christine went and found no one there.

"The first report was very loud, but a second and third were so great that dishes were thrown from the shelves and the house was completely rocked. We can see Mt. Pelée from the rear windows of the house, and although it is fully four miles away we can hear the roar and see the fire and lava issuing from it with terrific force.

"The city is covered with ashes and clouds of smoke have been over our heads for the past five days. The smell of sulphur is so strong that horses on the streets stop and snort and some of them are obliged to give up, drop in their harness and die from suffocation.

"Many of the people are obliged to wear wet handkerchiefs over their faces to protect them from the strong fumes of sulphur. My husband assures me that there is no immediate danger, and when there is the least particle of danger we will leave the place.

"There is an American schooner, the Anna E. J. Morse, in the harbor, and will remain here for at least two weeks. If the volcano becomes very bad we shall embark at once and go out to sea.

HEARTS BREAKING UNDER THE STRAIN.

Horror over the calamity had been the controlling feeling of the nation. Now came the sense of sympathy for residents here, whose hearts were breaking under the strain of waiting for definite news of loved ones in the stricken island.

The magnitude of the catastrophe was such as to appall everybody. It came with the suddenness of a thunderclap from

a clear sky. The reading public did not know that Mont Pelée had been showing signs of action.

But when the first shock was over there was an immediate thought of affording relief to the surviving victims of the great calamity. To this end active measures were immediately taken. Not only did our Government at Washington act promptly, but committees were formed in every part of the country for the purpose of collecting money and supplies.

VICTIMS OF FALSE SECURITY.

"Knowing the place as I do," said a resident of Martinique, "I have little doubt that the disaster was just as terrible as described, and my anxiety for the fate of my sister and other relatives is great. There have been several eruptions of Mont Pelée, but never such a terrible catastrophe as that which is being described in the papers. That is why I think the reports have not been exaggerated. Undoubtedly when the ashes began to fall people thought it would be unsafe to remain out of doors, and when the fatal eruption came were caught in their houses, victims of the false security engendered by previous comparatively harmless disturbances."

From Stockton, California, came the sad story that Mme. Louise Louit, a teacher of French in that city, was prostrated over the news of the terrible disaster, as her sister and family resided in that city. On learning of the volcanic eruption she swooned, and was in a serious condition for hours. Her sister, Mme. Gentile; her husband, two sons, George and Raoul, and two daughters, Alice and Anias, are believed to have been killed.

Raoul Gentile was rated as one of the most brilliant lawyers on the island, and for the past two years he was a member of the French Chamber of Deputies.

From Newark, New Jersey, came one of the most touching

stories. There was deep grief in the home of James McTear, of Newark, chief engineer of the Roraima, lost at St. Pierre. His bride of less than a year was completely prostrated, and in addition was in a delicate condition. With her were her mother and sisters, who vainly tried to cheer her with what were feared were false hopes. They anticipated that she would not survive her coming ordeal. McTear, who had been in the country five years, was a native of Glasgow, where his father, a man of means, still lives. In Newark he met Nellie Walker, and about a year ago he married her. They settled in a flat.

The poor wife sat surrounded by friends. Every time the door bell rang she started. She was not permitted to answer the summons, but anxiously asked "Is there any news?"

SCORCHED TO DEATH.

During the afternoon of the eighth the British steamer Roddam, which had left St. Lucia at midnight on the seventh for Martinique, crawled slowly into the Castries harbor, unrecognizable, gray with ashes, her rigging dismantled and sails and awnings hanging about, torn and charred.

Captain Whatter reported that having just cast anchor off St. Pierre, at 8 A. M. in fine weather, succeeding an awful thunder storm during the night, he was talking to the ship's agent, Joseph Plissono, who was in a boat alongside, when he saw a tremendous cloud of smoke and glowing cinders rushing with terrific rapidity over the town and port, completely in an instant enveloping the former in a sheet of flame and raining fire on board. The agent had just time to climb on board when his boat disappeared.

Several of the crew of the Roddam were quickly scorched to death.

By superhuman efforts, having steam up, the cable was slipped and the steamer backed away from the shore and, nine

hours later, managed to reach Castries. Ten of the Roddam's men were lying dead, contorted and burned out of human semblance, among the black cinders which covered the ship's deck to a depth of six inches. Two more of the crew have since died.

The survivors of the Roddam's crew were loud in their praises of the heroic conduct of their captain in steering his vessel out of danger with his own hands, which were badly burned by the rain of fire which kept falling on the ship for miles after she got under way. Beyond burns all over his body, the captain is safe, as is also the ship's agent, though he is badly scorched.

DOOMED CAPTAIN'S FAREWELL.

All the shipping in the port was utterly destroyed, the West Indian and Panama Telegraph Company's repairing steamer going first; then the Quebec Liner, Roraima, Captain Muggah, of the latter, waving his hand in farewell to the Roddam as his vessel sank with a terrific explosion.

The British Royal Mail Steamer Esk, which called off Martinique at 10 P. M. May 8th, reports standing off shore five miles, sounding her whistle and sending up rockets. She received no answer. The whole sea front was blazing for miles. The Esk sent a boat ashore, but it could not land on account of the terrific heat, which was accompanied by loud explosions. Not a living soul appeared ashore after the boat had waited for two hours. Fire and ashes fell all over the steamer.

The first mate of the Canadian steamer Roraima, which was lost in the harbor at St. Pierre, thus describes the disaster:

"Between 6.30 and 7 o'clock in the morning on May 8th, without warning, there came a sort of whirlwind of steam, boiling mud and fire, which suddenly swept the city and the roadstead. There were some eighteen vessels anchored in the harbor, including the Roraima, the French sailing ship Tamaya, four larger

sailing ships and others. All the vessels immediately canted over and began to burn. The Tamaya was a bark from Nantes, Captain Maurice, and was on her way to Point-a-Pitre. All the boats except the Roraima sank instantly and at the same moment.

"Every house ashore was utterly destroyed and apparently buried under the ashes and burning lava. An officer who was sent ashore penetrated but a short distance into the city. He found only a few walls standing and streets literally paved with corpses. The Governor of the island, who had arrived only a few hours before the catastrophe, was killed."

LIKE SODOM AND GOMORRAH.

[EX-CONSUL TUCKER SAYS THAT THE MORALS OF THE PEOPLE PROVOKED DIVINE WRATH.]

"My first thought when I read of the destruction of St. Pierre was that it was simply the history of Sodom and Gomorrah repeated," said Colonel Julius G. Tucker, former United States Consul in Martinique.

"The morals of the inhabitants of St. Pierre were very bad," he explained. "Good women were the exception among the natives. I cannot picture the vice and immorality of that place vividly enough. It had to be seen to be understood."

Colonel Tucker served the United States Government there from 1895 to 1899, having been appointed to the position by President Cleveland.

"The people were simply like rats in a trap, and had no way to turn. We never thought of an eruption proceeding from the volcano. It seemed entirely extinct, and the fact that a little lake lay at the bottom of the crater led strength to this supposition.

"The crater lays about twelve miles to the north and west of St. Pierre," he said. "And could be climbed after hard work. It was very steep with precipitous sides and rough rocks and

lava beds. The crater proper was about two hundred yards in diameter and eighty feet deep. At the bottom was the lake, containing clear, limpid water. The strange part about this lake was its unfathomable depth. All kinds of soundings were tried, but no one ever succeeded in finding the bottom.

ALL SUPPLIES FROM AMERICA.

"While I was Consul, I secured a pleasant little place on top of a mountain behind the city, where it was cooler. The city was excessively hot, there being little breeze on the Caribbean Sea, and the breeze from the Atlantic Ocean being cut off entirely by the mountain to which I refer.

"There is only one industry on the island of Martinique—that of sugar raising. Surprising to state, no sugar is exported. It is all turned into rum and then shipped to France. Everything necessary to the life of the inhabitants is gotten from the United States, but nothing is exported to this country. Despite the fact that the manufacture of rum was the principal industry, the inhabitants were never drunk. I never saw a drunken native on the island during my entire stay. The only intoxicated persons I ever saw were foreigners.

"There were very few Americans on the island, and not a single German. All countries are there represented except Germany, many having both Consuls and Vice Consuls.

"The inhabitants of St. Pierre were very superstitious and excitable. I remember that during my stay two earthquakes occurred, but they lasted only several seconds. Everything rattled and shook, and the people ran out into the streets and began praying and crying. The women screamed and fainted, and altogether excitement prevailed supreme. I cite this to give an idea of what must have occurred when the disaster overtook the people and destroyed their city and their lives."

On May 10, a message from St. Vincent, a neighboring British island, said :

"The Soufriere has been in a state of eruption for nine consecutive mornings. On May 8th, the day broke with heavy thunder and lightning, which soon changed into a continuous, tremendous roar. Vast columns of smoke rose over the mountain, becoming denser and denser, and the scoria-like hail, changing later to fine dust, fell upon all the adjacent estates, destroying a vast amount of property. At Chateau Belair the ashes were two feet deep in the street. In Kingston they were fully an inch deep, and many large stones fell in the parish of Georgetown.

"The earth shook violently and at 4 o'clock in the afternoon a midnight darkness spread over the country. Thirty people are known to have been killed and the damage to property in the windward district was very heavy."

STORM ROARED ALL NIGHT.

The storm roared about Soufriere all night without cessation, but on the following morning it became intermittent and fainter.

A report from Barbadoes says on May 7 the sky was heavily overcast, the heat was excessive and there was a distant sound of thunder. Later, early in the afternoon, dense darkness set in and a great quantity of vivid dust fell and continued falling until a late hour. No damage is reported.

The following cablegram was received from Governor Sir Frederick Mitchell Hodgson, of Barbadoes :

"The Soufriere volcano on St. Vincent erupted violently yesterday. Loud reports, resembling artillery fire, were heard at Barbadoes at 3 o'clock in the afternoon. At 5 o'clock there came darkness and thunder, accompanied by a strong downpour of dust, which continued until night. Barbadoes is covered several inches

deep with dust this morning. Have telegraphed Sir Robert Llewelyn, Governor of the Windward Islands, offering him all assistance."

AN HISTORICAL HURRICANE.

Although Martinique is an earthly paradise in its outward aspect, it has always been subjected to the wildest convulsions of nature. The first white invaders were told by the native Caribs of the fierce wind storms which swept the island at unexpected times, and the French planters soon learned that a case-a-vent, or hurricane house, was an indispensable adjunct of every plantation. These were not unlike the "cyclone cellars" of the Western plains, though they were usually built into or under the side of a hill, with walls of stone several feet in thickness. The door was of thick plank, there were no windows, and the air within, if the storm was of long duration, became most oppressive.

The great hurricane which destroyed the property of the father of the future Empress of the French occurred on the 13th of August, 1766, some seven weeks after Josephine's third birthday. Young as she was at the time, it made an indelible impression on her mind, and after she was Empress she used to thrill her ladies-in-waiting by vivid descriptions of that day of terrors. She had been snatched from her morning bath by her father, who had only time to wrap her in a large bath towel, and the full fury of the storm burst upon them as M. Tascher and his baby daughter passed through the door of the case-a-vent, where Madame Tascher and the terrified household slaves had already sought refuge.

Scarcely had the massive door been closed and bolted than the hurricane was upon them in all its fury. The tall palms writhed, and bent beneath its blows; mango and calabush, orange and guava trees were quickly stripped of their limbs or forcibly uprooted; roof-tiles from the mansion, boards from the negro

quarters and branches torn from trees were hurled through the air. The door of the case-a-vent groaned on its huge hinges, and strained at the iron bars stretched across it. The air within the cave became hot to suffocation; moans and cries arose from the terrified negroes; but little Josephine uttered not a word. Close clasping her arms around her father's neck, and clinging also to her mother's hand, she lay quiet and calm.

FAMOUS PALM AVENUE DESTROYED.

The hours passed slowly; but finally the door ceased to strain at its fastenings, and M. Tascher commanded the huge negro who had charge of it to open it a little way. Carefully and slowly the bolts were drawn and daylight admitted. All was quiet without. The darkness that had accompanied the storm, caused by the dense clouds and sheets of rain, had been dispelled by the sun, which was now shining brightly. The wind had died away to a moan; exhausted nature lay prostrate, torn and bleeding. Hardly a tree was left standing; huge ceibas, cedars and sapote trees had been uprooted and cast to the ground. But the most mournful spectacle was the palm avenue, for in place of the columnar trunks, with their waving plumes, was a ragged row of shattered stumps. The huts of the negroes, which had been grouped about the sugar mill, were entirely destroyed, and soon a hundred despairing beings were groping in their ruins. But the crowning desolation of all was the total destruction of the Tascher mansion.

Only the great sugar house remained standing of all the buildings pertaining to the estate. To this structure the now homeless family directed their steps. Its walls were of stone some two feet in thickness, its rafters heavy and covered with earthen tiles, the doorways were broad, with granite lintels. Above the ground floor, where the machinery was placed, were two large chambers. The beams supporting the floor were sound

and strong, and the floor itself intact, and there the family took up their abode. M. Tascher de La Pagerie never rebuilt the great house, and thus fate, or fortune, willed that Josephine should know no other place of residence while she lived in Trois-Ilets, unless visiting at the house of a friend, or at school. But she was to live to know still stranger places of abode; the grim Carmelite prison, the stately palace of the Tuileries and cheerful Malmaison, in whose gardens she cherished the plants of her native isle.

PRESIDENT ROOSEVELT'S EXAMPLE EMULATED

Following is the text of cable messages that passed between Presidents Roosevelt and Loubert on the Martinique disaster:

"Washington, May 10, 1902.

"His excellency, M. Emile Loubert, President of the French Republic, Paris:

"I pray your Excellency to accept the profound sympathy of the American people in the appalling calamity which has come upon the people of Martinique.

"THEODORE ROOSEVELT."

"President Roosevelt:

"I thank your Excellency for the expression of profound sympathy you have sent me in the name of the American people on the occasion of the awful catastrophe at Martinique. The French people will certainly join me in thanks to the American people. "EMILE LOUBERT."

Emperor William telegraphed to President Loubert, in French, as follows:

"Profoundly moved by the news of the terrible catastrophe which has just overtaken St. Pierre, and which has cost the lives of nearly as many persons as perished at Pompeii. I hasten to offer France my most sincere sympathy

"May the Almighty comfort the hearts of those who weep for their irreparable losses.

"My Ambassador will remit to your Excellency the sum of 10,000 marks ($2,500), in my behalf, as a contribution for the relief of the afflicted."

President Loubert replied:

"Am greatly touched by the mark of sympathy, which, in this terrible misfortune has fallen on France, your Majesty has deigned to convey to me.

"I beg you to accept my warm thanks, and also the gratitude of the victims whom you propose to succor."

The Czar telegraphed to President Loubert, expressing the sincere sympathy of himself and the Czarina, who share with France the sorrow caused by the terrible West Indian catastrophe.

ROOSEVELT RUSHES RELIEF.

On Monday the Commercial Cable Company announced that communication with Martinique is open via Azores and Lisbon, and made the following announcement showing the tortuous and expensive course necessary to get word from the stricken people:

"In sending a cable message from Martinique to New York it must pass from Fort-de-France to Paramaribo, 777 miles; Paramaribo to Cayenne, 257; Cayenne to Para, 562; Para to Pernambuco, 1,272; Pernambuco to St. Vincent, 1,862; St. Vincent to Madeira, 1,268; Madeira to Lisbon, 626; Lisbon to Fayal, 1,100; Fayal to New York, via Causo, 2,552. Total, 10,276 miles.

"Ordinarily the cable route to Martinique is 2,262 miles, and the time required for delivery of a message from three to five minutes. Now, the cable company says, it takes two hours to deliver a message in Martinique or in New York, as the case may be. The cable toll is $1.99 per word."

On Monday, May 12, important government work at Wash-

ington was practically suspended that the ships with supplies might be despatched promptly. President Roosevelt's enthusiasm, to which was added the hearty co-operation of three members of his Cabinet, set the machinery of the Government humming on that day in providing measures for the relief of the stricken survivors of the Martinique catastrophe. From early that morning until after the close of the official business day, there were more lively times at the White House and in certain bureaus of the Departments of the Treasury, War and the Navy. When the President and his busy subordinates finished their work they had the satisfaction of knowing that nothing within the province of the Administration had been left undone to further the work of humanity in the devastated island.

ROOSEVELT GOES RIGHT AT IT.

The French Ambassador, who called on President Roosevelt in the forenoon to deliver a message of thanks from the President of France for the sympathy expressed by this Government and to ask Mr. Roosevelt to assist in extending succor to the people of Martinique, learned that plans had already been set afoot to lend a strong hand in the work of relief. The direct result of the Ambassador's visit was the transmission of a message to Congress by President Roosevelt, asking that $500,000 be appropriated for the purchase of relief supplies and expense of their transportation and distribution. In his special message to Congress, he says:

"One of the greatest calamities in history has fallen upon our neighboring island of Martinique. The Consul of the United States at Guadeloupe has telegraphed from Fort-de-France, under date of May 11, that the disaster is complete; that the city of St. Pierre has ceased to exist, and that the American Consul and his family have perished. He is informed that thirty thousand people have lost their lives, and that fifty thousand are homeless and

hungry; that there is urgent need of all kinds of provisions, and that the visit of vessels for the work of supply and rescue is imperatively required.

"The Government of France, while expressing their thanks for the marks of sympathy which have reached them from America, inform us that Fort-de-France and the entire island of Martinique are still threatened. They, therefore, request that, for the purpose of rescuing the people who are in such deadly peril and threatened with starvation, the Government of the United States may send, as soon as possible, the means of transporting them from the stricken island. The island of St. Vincent, and, perhaps, others in that region are also seriously menaced by the calamity which has taken so appalling a form in Martinique.

"I have directed the departments of the Treasury, of War and of the Navy to take such measures for the relief of these stricken peoples as lie within the executive discretion, and I earnestly commend this case of unexampled disaster to the generous consideration of the Congress. For this purpose I recommend that an appropriation of $500,000 be made, to be immediately availing.

"THEODORE ROOSEVELT.

"WHITE HOUSE, Washington, May 12, 1902."

CONGRESS ACTS PROMPTLY.

After the message was received in the House Mr. Hemenway (Rep. Ind.) presented the Senate bill for the relief of sufferers by the volcanic disaster in the French West Indies, with a substitute unanimously recommended by the Committee on Appropriations, increasing the appropriation from $100,000 to $200,000.

Mr. Hemenway said this action was taken by the committee in view of the message from the President recommending that $500,000 be appropriated. Generous contributions were being made by

the people of the United States, and the committee believed that $200,000 would be sufficient at least for the present. Should it prove to be insufficient he had no doubt Congress would increase the amount. But prompt action was necessary if the people to be affected were to be relieved and rescued at all.

Mr. Underwood, of Alabama, again expressed his objection to the proposed legislation. Members did not stand in the House to legislate upon their sympathies, or upon their heartstrings. The suffering people, victims of the recent disaster, were subjects of the great and powerful republic of France, a nation whose proud boast it had always been that it was able to take care of its own people. Congress had no right to be generous with the money of the people whom it represented.

THE NATION'S SYMPATHY.

Mr. McRae, of Georgia, said he was glad to believe that the people of the United States were willing that Congress should not only express their sympathy with suffering, but that they were willing that Congress should extend the proposed relief. He hoped that the bill would be passed unanimously, but if that could not be done, that it should be passed speedily. [Applause.]

Mr. Livingston, of Georgia, said that it had been the practice of the United States ever since the Republic was established, to extend aid to the suffering, even to the uttermost parts of the earth, and he did not believe that the policy would now be reversed. [Applause.]

The bill was passed—196 to 9. The negative votes were cast by Messrs. Clayton of Alabama, Burgess and Lanham of Texas, Gains, Moon and Snodgrass of Tennessee, Tate of Georgia, Underwood of Alabama, and Williams of Mississippi.

Soon after the bill was passed the Senate received a message from the House announcing the passage by that body of a sub-

stitute for the Senate bill for the relief of the citizens of the French West Indies, increasing the appropriation from $100,000 to $200,000. The substitute was laid before the Senate and was immediately passed. Mr. Cullom referred to the President's message recommending an appropriation of $500,000 and said that the Committee on Foreign Relations, to which the message was referred, would report on it the next day.

PREPARATIONS TO SEND RELIEF.

A dozen other things were done during the day by the President and his assistants to show how thoroughly their sympathies had been enlisted by the distress of the people of Martinique. The following enumeration of what has been done by the Government shows how thorough is the scheme of relief.

The naval training ship Dixie ordered to sail immediately from Brooklyn with relief supplies—$70,000 worth of food, $5000 worth of medicine, $20,000 worth of clothing, blankets and shelter tents, three army Surgeons and one army Commissary, with $5000 to spend, to go on the Dixie; the naval collier Sterling ordered to load with stores at San Juan, Porto Rico, and proceed to Martinique; the naval training ship Buffalo, at Brooklyn, ordered to get ready to take more supplies; two naval water ships ordered to get ready for carrying fresh water to the sufferers; vessels of the United States Revenue Cutter Service and Coast Survey placed at the disposal of the War Department for carrying supplies or to take away survivors; the United States cruiser Cincinnati sails from San Domingo for Martinique to take away survivors and render other assistance; United States naval tug Potomac sails from San Juan, Porto Rico, for Martinique to take away survivors and render other assistance; National Red Cross asked to co-operate.

From this enumeration it will be seen that President Roose-

velt had a busy day. It was also a busy day for Secretary of the Navy Moody, who got to his office when a good many of his employees were just getting out of bed, and prepared to continue the good work he had begun in ordering the Cincinnati to Martinique, authorizing the Commandant at San Juan to send the Potomac there, and directing that the Dixie be made ready for sea. Secretary of War Root had directed Commissary-General Weston, Quartermaster-General Ludington and Surgeon-General Sternberg to order the concentration of supplies at the Brooklyn Navy Yard for shipment on the Dixie. Secretary of the Treasury Shaw sent notice to the proper officers of his Department to get revenue cutters and coast survey vessels in readiness for instant service.

PRESIDENT SUPERINTENDS THE WORK.

When President Roosevelt went to his office Monday morning he had made up his mind personally to superintend the arrangements for furnishing assistance to the people of Martinique. The first thing he did was to direct Secretary Cortelyou to inform the Secretaries of the Treasury, War and Navy what he wanted done. Mr. Cortelyou promptly sent this identical note to each of the three Cabinet officers:

"The President directs me to express to you his wish that your Department go to the furthest limits of executive discretion in the work of relief and rescue in the afflicted islands of the Caribbean."

It will be noticed that the relief measures contemplated by the President were not specifically restricted to Martinique, and it is understood that if St. Vincent or any other stricken community needed assistance it was to be furnished. In fact, the instructions to Commander McLean of the Dixie, which were mailed by the Navy Department that evening, permitted him to call at any of the British islands where relief may be necessary.

The President learned early through Secretary Hay that Thomas T. Prentis, of Melrose, Mass., the United States Consul at St. Pierre, Mrs. Prentis and their two daughters had lost their lives in the Martinique disaster. He learned also from the same source that thirty thousand people had lost their lives and that fifty thousand were homeless. This news came to Secretary Hay from Louis H. Ayme, United States Consul at Guadeloupe, who left there on the 10th for Martinique under instructions to ascertain the fate of the Prentis family and report conditions. Mr. Ayme's message, the substance of which was given by the President in his special message to Congress was as follows:

"The disaster is complete—the city wiped out. Consul Prentis and his family are dead. Governor says thirty thousand have perished; fifty thousand are homeless and hungry. He suggests that the Red Cross be asked to send codfish, flour, beans, rice, salt meats and biscuits as quickly as possible. Visits of war vessels valuable."

IMPERIALISTIC IN CHARITY.

Feeling confident that Congress would not neglect his appeal for authority to render assistance to the suffering islanders, President Roosevelt decided not to wait until an appropriation bill had been passed, but to order the immediate selection from the stores of supplies to the amount of $100,000, that being the sum authorized by the measure which passed the Senate and was delayed in the House on objection by Representative Underwood of Alabama. By his personal direction Secretary Root, the Subsistence, Quartermaster's and Medical Departments of the army were ordered to get these supplies ready for shipment on the Dixie, and by the time the relief resolution was passed by both houses the actual work of concentrating medicine, food, clothing, &c., at Brooklyn for shipment on the relief vessel was well under way.

The wisdom of Secretary Moody's decision to order the Dixie to prepare for sea was shown later, when the President decided to send relief supplies. Two days were gained by Mr. Moody's foresight. In response to the demand for more relief vessels, Mr. Moody sent instructions to the Commandant of the Brooklyn Navy Yard to have the training ship Buffalo put in condition to proceed to Martinique, and to the Commandant of the San Juan Naval Station to load the big collier Sterling with Quartermaster's stores and start for the devastated island when she had completed loading.

TUG POTOMAC SAILED FOR MARTINIQUE.

The first news which the Navy Department had that the tug Potomac had gone to Martinique came two days later from Captain Yates Stirling, the Commandant at the San Juan Naval Station. His telegram said that she sailed the day before. On the twelfth the Department got a telegram from Lieutenant Benjamin McCormack, the Potomac's commander, dated Island of Dominica, reporting his arrival there and that he was leaving immediately for Martinique.

Rear Admiral Royal B. Bradford, Chief of the Bureau of Equipment, who showed in the Spanish War that he was a resourceful officer, demonstrated again that he was alive to the requirements of an emergency, by suggesting to Secretary Moody that fresh water for drinking purposes be sent to Martinique. He not only made this suggestion, but offered to furnish means to carry it out. His idea was among the first to be laid before the President and the Cabinet by Secretary Moody, when the relief plans were perfected. Admiral Bradford's suggestion was embodied in this memorandum for Secretary Moody:

"It has occurred to the Bureau that the refugees from the island of Martinique may suffer for the want of good water.

Naturally surface water will be strongly impregnated with sulphur, and therefore unsuitable for drinking purposes. There is a good water barge at Key West, with a capacity of 175,000 gallons ready for immediate use. There is another one at Norfolk, with a capacity of 400,000 gallons, ready for immediate use. They might be towed at once to whatever locality is selected for a camp for the refugees. They can be refilled at Kingston, Jamaica, or Cape Haytien, Hayti, where there is an abundance of good water."

Colonel William H. Michael, Chief Clerk of the State Department, who is a member of the Executive Board of the National Red Cross, reported that arrangements were being made for a special meeting of the board to devise means for distributing relief to the people of Martinique. Miss Clara Barton, President of the National Red Cross had left Washington for Russia to attend the Convention of the Red Cross Organization of the World. Brigadier-General John M. Wilson, United States Army, retired, is First Vice-President of the National Red Cross. General Wilson was in Washington.

ROBBING THE DEAD.

The following despatch reached the United States by way of London, Wednesday, May 14th:—The incineration and burying of the dead at St. Pierre is still going on, but under great difficulties. The only men engaged in it are French soldiers. A small squad of them is at work. The entire atmosphere of the place is so saturated with the stench that the burial parties are made ill by it. The men can only work for a short time at a stretch.

In spite of the horrors of the place thieves are penetrating it, robbing the dead and digging in the ruins for treasure.

Over Mont Pelée there still hangs a great cloud of smoke. The eruption continues with diminished force.

A despatch from London received the same day said that Mont Pelée was still in eruption. Further disasters are feared.

Another despatch from Fort-de-France says that persons returning from St. Pierre report that the looting of the dead in that place had begun.

It is stated that the authorities are paying little attention to the cremation or burial of the bodies of the victims.

The tug Potomac, which was despatched from Porto Rico by the United States Navy Department, cruised along the coast. She encountered a dense cloud of black smoke and was obliged to go five miles out of her course to avoid it.

POTOMAC CATCHES LOOTERS.

While on her way to Fort-de-France the Potomac picked up a small open boat in which were five negroes and a white man. They all had their pockets stuffed with gold and jewels, which they had stolen at St. Pierre. Lieutenant McCormack, the commander of the Potomac, placed the men under arrest and subsequently turned them over to the commander of the French cruiser Suchet.

The only persons employed in burying the dead at St. Pierre are a small detachment of French soldiers.

A despatch to the "Daily Mail" from Fort-de-France, dated May 12, and cabled by way of Pinheiro and Pernambuco, describes the correspondent's eighty-mile journey from Guadeloupe to Martinique, where he arrived Sunday morning. Mont Pelée was shrouded in a dull violet-colored haze, which extended a mile above the mountain. The haze had assumed the shape of a giant mushroom, and its outer edges, where it caught the sun, showed a beautiful amber tint. Three miles from the land the ocean was strewn with wreckage. Many corpses were seen floating, on which sea birds and sharks were preying.

The correspondent's boat reached the village of Precheur, a few miles north of St. Pierre, and it was found that the place had been partly destroyed by fire. The few remaining inhabitants on the shore begged to be taken off. They were told that help was on the way to them, and the boat proceeded.

When off St. Pierre it was seen that all that remained of the city were long rows of ruined walls, plastered with volcanic mud. A nauseating odor came off from the shore.

The boat hailed the mail steamer Solent, which was in the roadstead, and the latter directed the correspondent how to land. In many places tens and scores of victims were seen in a single mass. Here and there fires were still burning.

A despatch to the "Express" from St. Thomas says that the Danish cruiser Valkyrien, rescued 500 survivors on the northeast coast of Martinique. The French cruiser Suchet rescued 2000, and the cable ship Pouyer Quertier a large number. All were conveyed to Fort-de-France.

Only one life is known to have been saved in St. Pierre, that of a prisoner in jail. The French bank transferred all its funds and books to the cruiser Suchet before the catastrophe.

SOME NOT KILLED OUTRIGHT.

A despatch from Fort-de-France states a servant named Laurent, who was employed by a family in St. Pierre, was among the survivors who were taken to the hospital at Fort-de-France. The physicians did everything in their power to save the life of the woman, but she was horribly burned and their efforts were in vain.

Despite her injuries she was conscious and told what little she knew of the disaster. She said that she was going about her duties as usual last Thursday morning when suddenly she heard a terrific explosion. She was so badly frightend that she fainted, and while in this condition she was terribly burned. She remained

unconscious for a long time, but ultimately recovered her senses.

She then saw two members of the family in which she was employed who were still alive, but frightfully burned. They died before assistance could reach them.

The woman stated that she had no further knowledge of the catastrophe, and shortly after telling her story she died.

The cable steamer Pouyer Quertier has distributed large quantities of provisions among the sufferers.

ACCESS TO THE TOWN NOW EASIER.

An undated despatch from Fort-de-France says that access to St. Pierre had been easier since the catastrophe. No signs of fire were then visible.

At the mouillage everything appeared scattered as by a tornado. The iron gates of the Custom House are standing. The iron beds that were used in the hospital are twisted by the great heat, but do not bear any other signs of fire. The bed clothes and other textiles have completely disappeared.

Two thousand corpses were found on the streets, most of the bodies lying face downward. The centre of the town and the fort are buried under several yards of cinders.

In the neighborhood of the creek several houses were found intact, but their inmates were dead, their bodies looking as though they had been struck by lightning.

M. Decrais, Minister for the Colonies, received the following despatch from Fort-de-France, Martinique, signed by M. L'Huerre, Secretary-General of the Government of Martinique :

"The perimeter ravaged includes Carbet, Precheur and Macouba. Basse Pointe is also damaged. Precheur has been annihilated and it is believed the same fate has befallen Grande Riviere and Macouba.

"Senator Knight landed at Precheur and buried four hundred bodies. He brought the survivors to Fort-de-France yesterday. The work of the commander of the Suchet is above praise. The three children of Governor Mouttet will sail on the mail steamer on June 1, for France. They will be accompanied by M. Mulle- Governor Mouttet's chief in the Cabinet."

GHASTLY FEASTS FOR SHARKS.

M. Decrais has received the following despatch, dated Fort-de-France, Martinique, May 12 :

"There are only twelve survivors at the military hospital here, whereas there are 30,000 corpses strewn at St. Pierre beneath the ruins or afloat on the waves, where the sharks are devouring them.

"Twenty of the dying, who were half calcined, were brought here. Of this number sixteen have already died.

"On Sunday the island was hid beneath a thick veil of mist of a leaden color. The sea was strewn with wreckage of ships, dwellings and trees and corpses. Above the latter sea fowl hover around. Occasionally there is a breeze, alternately burning and icy.

"The ruins of St. Pierre continue to burn. The air is filled with odor of burning flesh. No house is intact. Everywhere there are masses of wood, hot cinders and volcanic stones. The streets have disappeared. The corpses lie nearly all face downward.

"On one spot the bodies of twenty-two men, women and children lie huddled together near a wall, with their arms and legs protruding. A small rivulet flows where once was the Place Bertin. This is all that remains of the Goyave River. Large trees twisted by fire lie with their roots upward beneath a mass of rubbish, from which emerges the arm of a white woman.

"It appears that the volcanic torrent contained poisonous gases. All the victims who have been found apparently covered their mouths in order to avoid death by suffocation.

"All those who were saved come from neighboring villages. Not a single soul was saved from St. Pierre itself."

ST. VINCENT STRICKEN.

The following distressing despatches poured into the United States on Wednesday, the 14th :—

CASTRIES, St. Lucia, May 13th.—"Advices have just reached here from St. Vincent placing the loss of life in that island by the eruption of La Soufriere at 1600."

ST. THOMAS, D. W. I., May 13th.—"The latest advices that have reached here from the island of St. Vincent only add to the horrors of the situation there. It was thought when the news of the disaster first became known that, though the material loss would be heavy, the death list would not be very large; but it is now known that up to the present time the fatalities number 700, and grave fears are entertained that the list is not yet complete.

"La Soufriere continues to emit fire and cinders, and it is thought that the eruption will not cease until Mont Pelée, in Martinique, becomes quiescent."

LONDON, May 13th.—"There is considerable anxiety here as to the condition of affairs on the British island of St. Vincent. The latest news which was received about thirty-six hours ago, was to the effect that La Soufriere was still in eruption. Since then no definite news has been received in official quarters. The latest information was that the northern part of the island was cut off from the southern end by enormous streams of lava and that boats' crews were unable to land."

ST. THOMAS, D. W. I., May 13th.—"The Danish cruiser Valkyrien has rescued five hundred refugees from points along

the coast in the north and northeastern parts of the island of Martinique.

"The French gunboat Suchet, whose officers and crew have been working heroically since the disaster overtook St. Pierre, has rescued 2000 persons. Everybody aboard the little warship is nearly exhausted, but the vessel hardly arrives at Fort-de-France with survivors before all hands are eager to again set out on their work of mercy.

"The French cable steamer Pouyer Quertier has also assisted in the work of rescue and has taken all the survivors that she picked up to Fort-de-France, where the other vessels have also landed all those they rescued.

"All the house accommodation at Fort-de-France was taken up days ago. Large numbers of the survivors are occupying tents furnished by the Government, but the crowds of refugees are so large that many are compelled to shift for themselves as best they can."

STENCH FROM ROTTING CORPSES.

The stench from the bodies in the ruins of the town is intolerable. The scene of desolation in St. Pierre and for miles around is beyond the power of words to describe.

The report that the French Bank at St. Pierre transferred its funds and books to the Suchet before the catastrophe, was based upon the fact that the vaults of the bank were found to be intact and the securities and cash were removed by the Suchet to Fort-de-France.

People who went to see Mr. Roosevelt at the White House found him too busy to attend to anything except the consummation of the relief measures, which he initiated soon after the catastrophe, and if the Hon. Henry Watterson had been there with others who profess to believe with him that Mr. Roose-

velt pursues "bronco busting" methods in carrying on his administration, they might have found some confirmation of their contention.

The President did not "bust" any wild horses, but he tore into little bits a large amount of official red tape, and broke down a few figurative fences that under other administrations might have retarded the progress of his intention to get relief to the scene of the West Indian catastrophe with the least possible delay. In doing these things his training as Assistant Secretary of the Navy served him in good stead.

APPEALS FROM RED TAPE TO THE AMERICAN PEOPLE.

The most important thing the President did was to issue an appeal to the people of the United States to send private contributions to committees named by him for the assistance of the surviving inhabitants of Martinique and St. Vincent, and in addition to the pleasure of signing the act appropriating $200,000 for relief measures, the expenditure of nearly every cent of which had been provided for before the act had even passed the House, he had the satisfaction of knowing that the Senate had adopted an additional measure to increase the relief fund to the half million dollars asked for by the President in his special message.

The appeal was issued at the end of a Cabinet meeting lasting three hours. It is as follows:

"The President appointed a committee of eminent Americans to receive funds for the relief of the sufferers from the recent catastrophes in Martinique and St. Vincent. The men appointed from each city were asked to collect and receive the funds from their localities and neighborhoods as expeditiously as possible and forward them to Cornelius N. Bliss, Treasurer of the New York committee, which committee acted as the central distributing point for the country."

The President directed all the postmasters throughout the country, and requested the presidents of all the national banks, to act as agents for the collection of contributions, to forward the same at once to Mr. Bliss at New York. The postmasters were also directed to report to the Postmaster-General, within ten days, any funds collected on this account.

QUICK CHARITY NEEDED.

The President appealed to the public "to contribute generously for the relief of those upon whom this appalling calamity had fallen, and asked that the contributions be sent in as speedily as possible." The men designated on the several committees are requested to act at once. Following were the committees :

New York—The Hon. Cornelius N. Bliss, treasurer; Morris K. Jessup, John Claflin, Jacob H. Schiff, William R. Corwine.

Boston—Augustus Hemenway, Dr. Henry S. Pritchett, Henry Lee Higginson.

Philadelphia—Charles Emory Smith, Provost Charles C. Harrison, Joseph G. Darlington, Clement A. Griscom, John H. Convers.

Baltimore—James A. Gary.

Washington—Charles C. Glover.

Pittsburg—A. J. Logan, H. C. Frick.

Buffalo—John G. Milburn, Carlton Sprague.

Cleveland—Myron T. Herrick, Samuel Mather.

Cincinnati—Jacob G. Schmidlapp, Briggs S. Cunningham.

Chicago—J. J. Mitchell, Marvin Hughitt, Marshall Field, Graeme Stewart.

Milwaukee—F. G. Bigelow, Charles F. Pfister, Fred Pabst.

Minneapolis—Thomas Lowry and J. J. Shevlin.

St. Paul—Kenneth Clark and Theodore Schurmeir.

Detroit—Don M. Dickinson.

St. Louis--Charles Parsons, Adolphus Bush and Robert S. Bookings.

Louisville—Thomas Bullitt.

Atlanta—Robert J. Lowry.

Kansas City—W. B. Clark and Charles Campbell.

Omaha—John C. Wharton and Victor B. Caldwell.

Denver—D. H. Moffatt.

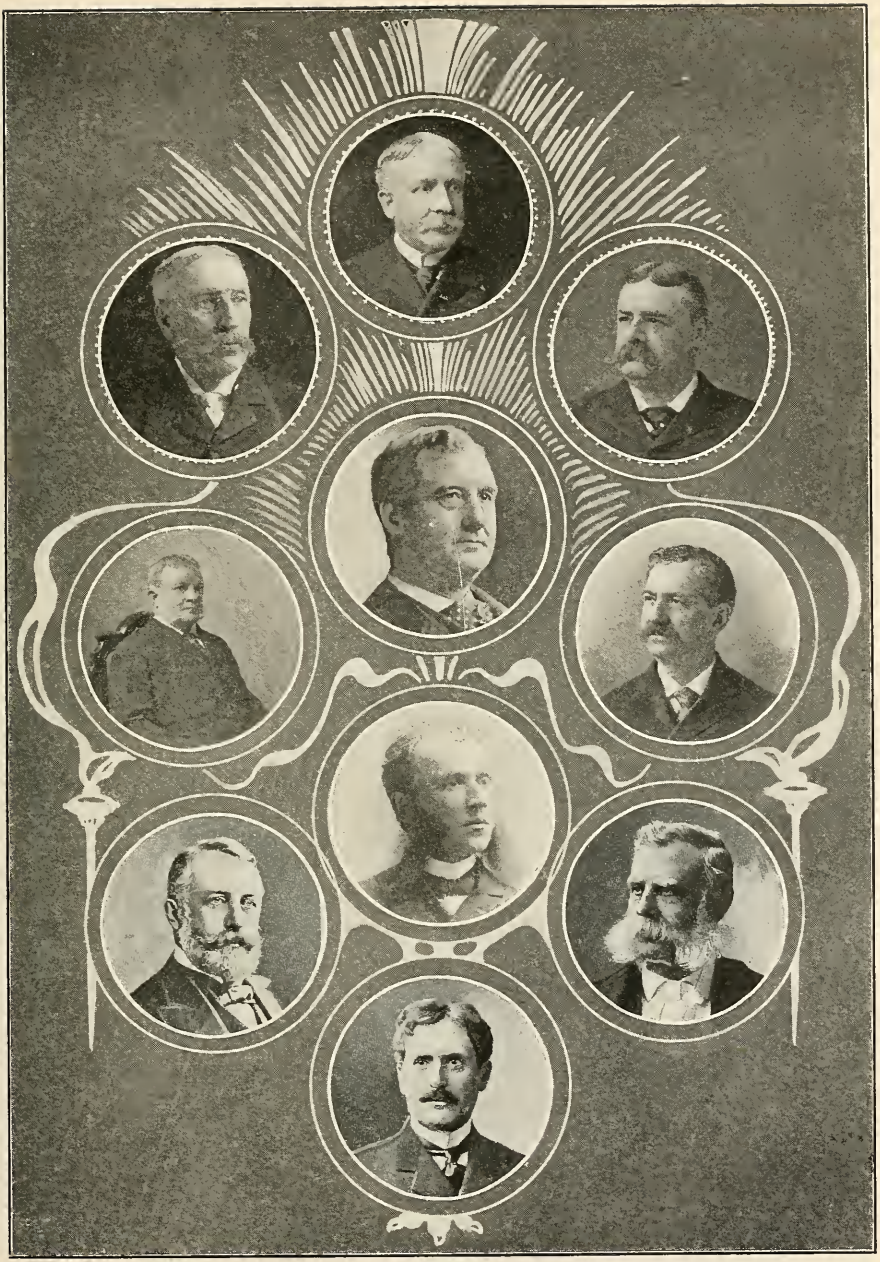
San Francisco—Mayor Schmitz, George A. Newhall, A. Shardoro, Robert J. Tobin, Henry T. Scott, A. A. Watkins.

New Orleans—The Hon. Paul Capdevielle, Mr. I. L. Lyons, Mr. S. T. Walmsley.

THE CABINET AT WORK.

A good part of this extra-long Cabinet session was taken up in considering relief measures. It was realized by Mr. Roosevelt and his advisers, after a brief review of the situation, the $200,000 appropriated by Congress was entirely too small to carry out the comprehensive plans of the Government. The cost of provisions, medicine and other supplies already ordered sent to St. Pierre is nearly equal to the full appropriation, and as the latest news from St. Vincent indicated that much distress prevails there, an additional expenditure for relief will be required.

President Roosevelt and his Cabinet were determined not to undertake any half-way measures, and they were anxious to give to the stricken people of the British island the same degree of succor that had been deemed necessary for its French neighbor. On account of the advantageous geographical situation of this country to Martinique and St. Vincent the United States Government was in better position than England or France to send assistance to the West Indian colonies of those nations, and the President was going ahead on the idea that diplomatic formalities, such as offering aid before undertaking to give it, should be dispensed with.



PROMINENT MEMBERS OF THE MARTINIQUE RELIEF COMMITTEE

J. H. CONVERSE, PHILA.
C. N. BLISS, NEW YORK
H. C. FRICK, PITTSBURG
J. G. DARLINGTON, PHILA.
J. G. MILBURN, BUFFALO
D. M. DICKINSON, DETROIT
M. J. HERRICK, CLEVELAND
C. A. GRISCOM, PHILA.
C. E. SMITH, PHILA.
J. A. GARY, BALTIMORE

SCENE SHOWING DOCKS AT ST. PIERRE, MARTINIQUE

ST. PIERRE, MARTINIQUE, FROM THE HILL

HOUSES OF THE POOR CLASSES IN ST. PIERRE, MARTINIQUE

AVENUE OF PALMS NEAR ST. PIERRE, MARTINIQUE

PINE APPLE GROVE NEAR ST. PIERRE, MARTINIQUE

TROPICAL SCENE NEAR ST. PIERRE, MARTINIQUE

MARKET—ST. PIERRE, MARTINIQUE—SHOWING TROPICAL FRUITS

CHAPTER I.

APALLING CALAMITY IN THE ISLANDS OF MARTINIQUE AND ST. VINCENT.—TRAGIC DEATH OF MANY THOUSANDS OF PEOPLE. DESCRIPTION OF THE ISLANDS.—FRIGHTFUL SCENES OF DEVASTATION.

TENS of thousands of men, women and children swept to sudden death. Beautiful cities buried in a few minutes under an appalling downpour of hot cinders, ashes and streams of lava. Scenes of suffering and devastation that beggar description. Our whole country and the rest of the civilized world horrified by the appalling news of the greatest calamity in many centuries. Such is the tragic story of Martinique and other portions of the fair West Indies.

There have been many disasters by flood and fire in recent times, but none to equal this. The Johnstown calamity was on a far less scale. The dreadful Galveston flood did not result in an eighth part of the loss of life that has visited St. Pierre and other cities whose doom has been sealed by this dire calamity. In a moment, in the twinkling of an eye, as it were, a multitude of human beings were plunged into the jaws of death. Fine residences shared the fate of the humbler dwellings of the poor. Buildings devoted to business, churches, markets, ships in the harbor, all were consumed by the ruthless rain of fire.

The news of the overwhelming disaster came as a shock to people everywhere. Bulletin boards in all our cities were surrounded by eager crowds to obtain the latest reports. Many who had friends in the stricken island were kept in suspense respecting their fate. With bated breath was the terrible calamity talked about, and in every part of our country committees of relief were immediately formed. The magnitude of the disaster grew from day to day. Every fresh report added to the intelligence already received, and it was made clear that many thou-

sands of the inhabitants in the West Indies had been swept out of existence.

In order that the reader may have an intelligent understanding of the calamity depicted in this volume, it is needful to furnish here an account of the Islands of Martinique and St. Vincent. They are of great interest, both as regards their physical features, their products and their inhabitants.

Martinique, one of the West India islands, belonging to the chain of the Lesser Antilles, and constituting a French colony, lies 33 miles south of Dominica and 22 north of Saint Lucia. The greatest length is 45 miles, the mean width 19; and the surface comprises nearly 400 square miles. A cluster of volcanic mountains near the north end, a similar group in the south and a line of lower heights between them, form the backbone of the island, which culminates in the northwest in Mont Pelée (4430 feet), and has altogether a much more irregular and strongly marked relief than it presents to the eye—the deep ravines and precipitous escarpments with which it abounds being reduced in appearance to gentle undulations by the drapery of the forests.

DEEP AND DESTRUCTIVE TORRENTS.

Of the numerous streams which traverse the few miles of country between the watershed and the sea, about seventy or eighty are of considerable size, and in the rainy season become deep and often destructive torrents. The east coast of the island, exposed to the full sweep of the Atlantic, is a succession of inlets, headlands, islands and rocks; the south coast is much more regular, but bold and steep; and the west alone presents, in the bay of Fort de France, a stretch of mangrove swamp.

Of the total area, about 83,990 acres are under cultivation, 83,843 occupied by forests and savanna and 68,837 by fallow. On an average, 47,440 acres are devoted to the sugar crop, 1290 to coffee, 640 to cotton and 1660 to cocoa. The mean annual temperature is 81° in the coast region, the monthly mean for June being 83°, and that of January 77°. Of the annual rainfall of 87 inches, August has the heaviest share (11.3 inches), though

the rainy season extends from June to October; March, the lowest, has 3.7.

Martinique enjoys a remarkable immunity from hurricanes; half a century may pass without serious disaster from such a visitation. The great mass of the population consists of Creole negroes and half-castes of various grades, ranging from the "Saccatra," who has hardly retained any trace of Caucasian blood, to the so-called "Sangmelé," with his mere suspicion of negro commixture.

Fort de France, the capital, stands on a bay on the west coast. Since the earthquake of 1839 nearly all the houses are of wood, and have only one story; the streets are laid out with great regularity. An abundant supply of water was introduced in 1856. St. Pierre, the commercial centre of the island, lies farther north on the same coast. It consists of a lower and upper town, the one close and unhealthy, and the other for the most part well paved and pleasant.

INHABITANTS OF MARTINIQUE.

Martinique, also called Madina or Matinino, was discovered by Columbus, 15th June, 1502. It was at that time inhabited by Caribs, who had expelled or incorporated an older stock. In 1635 a Norman captain, D'Enambuc, from St. Christopher's, took possession of the island, and in 1637 his nephew, Duparquet, became captain-general of the colony. In 1654 welcome was given to three Jews expelled from Brazil, and by 1658 there were at least five thousand people, exclusive of the Caribs, who were soon after exterminated.

Purchased by the French Government from Duparquet's children, Martinique was assigned to the West India Company, but in 1674 it became part of the royal domain. The French landholders at first devoted themselves to the cultivation of cotton and tobacco, but in 1650 sugar plantations were commenced, and in 1726 the coffee plant was introduced by Desclieux, who, when water ran short during his voyage to the island, shared his scanty allowance with his seedlings.

Slave labor having been introduced, there were 72,000 blacks in the island by 1736. Martinique has several times been occupied by the English. Captured by Rodney, in 1762, it was next year restored to the French, but after the conquest by Sir John Jervis and Sir Charles Grey, in 1794, it was retained for eight years, and, seized again in 1809, it was not surrendered till 1814.

The interesting narrative of a traveler in the West Indies contains the following:

"We are ashore in St. Pierre, the quaintest, queerest and the prettiest withal, among West Indian cities: all stone-built and stone-flagged, with very narrow streets, wooden or zinc awnings, and peaked roofs of red tile, pierced by gable dormers. Most of the buildings are painted in a clear yellow tone, which contrasts delightfully with the burning blue ribbon of tropical sky above; and no street is absolutely level, nearly all of them climb hills, descend into hollows, curve, twist, describe sudden angles. There is everywhere a loud murmur of running water—pouring through the deep gutters contrived between the paved thoroughfare and the absurd little sidewalks, varying in width from one to three feet.

QUAINT STYLES OF ARCHITECTURE.

The architecture is quite old: it is seventeenth century, probably; and it reminds one a great deal of that characterizing the antiquated French quarter of New Orleans. All the tints, the forms, the vistas, would seem to have been especially selected or designed for aquarelle studies—just to please the whim of some extravagant artist. The windows are frameless openings without glass; some have iron bars; all have heavy wooden shutters with movable slats, through which light and air can enter as through Venetian blinds. These are usually painted green or bright bluish-gray.

So steep are the streets descending to the harbor—by flights of old mossy stone steps—that looking down them to the azure water you have the sensation of gazing from a cliff. From certain openings in the main street—the Rue Victor Hugo—you can get something like a bird's-eye view of the harbor with its shipping.

The roofs of the street below are under your feet, and other streets are rising behind you to meet the mountain roads. They climb at a very steep angle, occasionally breaking into stairs of lava rock, all grass-tufted and moss-lined.

The town has an aspect of great solidity; it is a creation of crag—looks almost as if it had been hewn out of one mountain fragment, instead of having been constructed stone by stone. Although commonly consisting of two stories and an attic only, the dwellings have walls three feet in thickness; on one street, facing the sea, they are even heavier, and slope outward like ramparts, so that the perpendicular recesses of windows and doors have the appearance of being opened between buttresses. It may have been partly as a precaution against earthquakes, and partly for the sake of coolness, that the early colonial architects built thus; giving the city a physiognomy so well worthy of its name—the name of the Saint of the Rock.

STREETS WASHED BY MOUNTAIN WATER.

And everywhere rushes mountain water—cool and crystal clear, washing the streets; from time to time you come to some public fountain flinging a silvery column to the sun, or showering bright spray over a group of black bronze tritons or bronze swans. The tritons on the Place Bertin you will not readily forget; their curving torsos might have been modelled from the forms of those ebon men who toil their tirelessly all day in the great heat, rolling hogsheads of sugar or casks of rum.

And often you will note, in the course of a walk, little drinking-fountains contrived at the angle of a building, or in the thick walls bordering the bulwarks or enclosing public squares; glittering threads of water spurting through lion-lips of stone. Some mountain torrent, skilfully directed and divided, is thus perpetually refreshing the city—supplying its fountains and cooling its courts. This is called the Gouyave water: it is not the same stream which sweeps and purifies the streets.

Picturesqueness and color; these are the particular and the unrivalled charms of St. Pierre. As you pursue the Grande Rue,

or Rue Victor Hugo—which traverses the town through all its length, undulating over hill slopes and into hollows and over a bridge—you become more and more enchanted by the contrast of the yellow-glowing walls to right and left with the jagged strip of gentian-blue sky overhead. Charming also it is to watch the cross streets climbing up to the fiery green of the mountains behind the town. On the lower side of the main thoroughfare other streets open in wonderful bursts of blue—warm blue of horizon and sea.

The steps by which these ways descend towards the bay are black with age, and slightly mossed close to the wall on either side; they have an alarming steepness—one might easily stumble from the upper into the lower street. Looking towards the water from these openings from the Grande Rue, you will notice that the sea line cuts across the blue space just at the level of the upper story of the house on the lower street corner. Sometimes, a hundred feet below, you see a ship resting in the azure aperture —seemingly suspended there in sky-color, floating in blue light.

A REMARKABLE PEOPLE.

And everywhere and always, through sunshine or shadow, comes to you the scent of the city—the characteristic odor of St. Pierre; a compound odor suggesting the intermingling of sugar and garlic in those strange tropical dishes which creoles love."

A population fantastic, astonishing—a population of the Arabian Nights. It is many-colored; but the general dominant tint is yellow, like that of the town itself—a general effect of rich brownish yellow. You are among a people of half-breeds—the finest mixed race of the West Indies.

Straight as palms, and supple and tall, these colored women and men impress one powerfully by their dignified carriage and easy elegance of movement. They walk without swinging of the shoulders; the perfectly set torso seems to remain rigid; yet the step is a long, full stride, and the whole weight is springily poised on the very tip of the bare foot. All, or nearly all, are without shoes: the treading of many naked feet on the heated pavement makes a continuous whispering sound.

Perhaps the most novel impression of all is that produced by the singularity and brilliancy of certain of the women's costumes. These were developed, at least a hundred years ago, by some curious sumptuary law regulating dress of slaves and colored people of free condition—a law which allowed considerable liberty as to material and tint, prescribing chiefly form.

But some of these fashions suggest the Orient; they offer beautiful audacities of color contrast; and the full-dress coiffure, above all, is so strikingly Eastern that one might be tempted to believe it was first introduced into the colony by some Mohammedan slave. It is merely an immense Madras handkerchief, which is folded about the head with admirable art, like a turban—one bright end pushed through at the top in front, being left sticking up like a plume.

PECULIARITIES OF DRESS.

Then this turban, always full of bright canary-color, is fastened with golden brooches—one in front and one at either side. As for the remainder of the dress, it is simple enough; an embroidered, low-cut chemise with sleeves; a skirt, very long behind, but caught up and fastened in front below the breasts so as to bring the hem everywhere to a level with the end of the long chemise; and finally as a silken kerchief, thrown over the shoulders. These skirts and kerchiefs, however, are exquisite in pattern and color; bright crimson, bright yellow, bright blue, bright green—lilac, violet, rose—sometimes mingled in plaidings or checkerings or stripings; black with orange, sky-blue with purple.

And whatever be the colors of the costume, which vary astonishingly, the coiffure must be yellow—brilliant, flashing yellow; the turban is certain to have yellow stripes or yellow squares. To this display add the effect of costly and curious jewelry; immense ear-rings, each pendant being formed of five gold cylinders joined together (cylinders sometimes two inches long, and an inch at least in circumference); a necklace of double, triple, quadruple, or quintuple rows of large hollow gold beads (sometimes smooth, but generally graven).

Now, this glowing jewelry is not a mere imitation of pure metal; the ear-rings are worth forty dollars a pair; the necklace of a Martinique quadroon may cost five hundred or even one thousand francs. It may be the gift of her lover; but such articles are usually purchased either on time by small payments, or bead by bead singly until the requisite number is made up.

But few are thus richly attired; the greater number of the women carrying burdens on their heads—peddling vegetables, cakes, fruit, ready-cooked food, from door to door—are very simply dressed in a single plain robe of vivid colors reaching from neck to feet, and made with a train, but generally girded well up so as to fit close to the figure and leave the lower limbs partly bare and perfectly free.

CAPABLE OF GREAT ENDURANCE.

These women can walk all day long up and down hill in the hot sun, without shoes, carrying loads of from one hundred to one hundred and fifty pounds on their heads; and if their little stock sometimes fails to come up to the accustomed weight stones are added to make it heavy enough. Doubtless the habit of carrying everything in this way from childhood has much to do with the remarkable vigor and erectness of the population.

I have seen a grand piano carried on the heads of four men. With the women the load is very seldom steadied with the hand after having been once placed in position. The head remains almost motionless, but the black, quick, piercing eyes flash into every window and doorway to watch for a customer's signal. And the creole street-cries, uttered in a sonorous, far-reaching high key, interblend and produce random harmonies very pleasant to hear.

Every inch of this magic island is draped in forests, except where man has made temporary clearings—forests which cannot be described, photographed, or painted. The following description by Dr. E. Ruiz gives only a faint idea of the island's wonders:

Only the sea can afford us any term of comparison for the attempt to describe a grand forest; but even then one must imagine the sea on a day of storm, suddenly immobilized in the

expression of its mightiest fury. For the summits of these vast woods repeat all the inequalities of land they cover; and these inequalities are mountains from forty-two to forty-eight hundred feet in height, and valleys of corresponding profundity. All this is hidden, blended together, smoothed over by verdure, in soft and enormous undulations, in immense billowings of foliage. Only, instead of a blue line at the horizon, you have a green line; instead of flashings of blue, you have flashings of green, and in all the tints, in all the combinations of which green is capable—deep green, light green, yellow green, black green.

When your eyes grow weary—if it indeed be possible for them to weary—of contemplating the exterior of these tremendous woods, try to penetrate a little into their anterior. What an inextricable chaos it is! The sands of a sea are not more closely pressed together than the trees are here—some straight, some curved, some upright, some toppling, fallen, or leaning against one another, or heaped high upon each other.

LUXURIOUS VEGETATION.

Climbing lianas, which cross from one tree to the other, like ropes passing from mast to mast, help to fill up all the gaps: and parasites—not timid parasites like ivy or like moss, but parasites which are trees self-grafted upon trees—dominate the primitive trunks, overwhelm them, usurp the place of their foliage, and fall back to the ground, forming fictitious weeping-willows. You do not find here, as in the great forests of the North, the eternal monotony of birch and fir: this is the kingdom of infinite variety; species the most diverse elbow each other, interlace, strangle and devour each other; all ranks and orders are confounded, as in a human mob. The oak forces the palm to lengthen itself prodigiously in order to get a few thin beams of sunlight; for it is as difficult here for the poor trees to obtain one glance from this king of the world as the subjects of a monarchy to obtain one look from their monarch. As for the soil, it is needless to think of looking at it; it lies as far below us, probably, as the bottom of the sea; it disappeared, ever so long ago, under the heaping of

debris, under a sort of manure that has been accumulating there since the creation; you sink into it as into slime; you walk upon putrefied trunks, in a dust that has no name!

Here, indeed, it is that one can get some comprehension of what vegetable antiquity signifies: a lurid light, greenish, as wan at noon as the light of the moon at midnight, confuses forms and lends them a vague and fantastic aspect; a dense humidity exhales from all parts; an odor of death prevails; and a calm which is not silence (for the ear fancies it can hear the great movement of composition and of decomposition perpetually going on) tends to inspire you with that old mysterious horror which the ancients felt in the primitive forests of Germany and of Gaul:

"Arboribus suus horror inest."

VARIOUS KINDS OF WOOD.

Among the trees are the silk-cotton, species of mahogany and the caleta, or ironwood, a very strong wood. The flora is numerous, and closely related to that of the equatorial zone of South America. The fauna abounds in minor reptiles and insects. There are various kinds of fish and of crab. The manicon and a certain lizard are eaten. The only animal of note is the vicious serpent known as the fer-de-lance, which lurks in the woods, the cane-fields, and the gardens, and whose fatal bite is the only thing upon the island to be dreaded. This snake is from four and a half to seven feet long, has four fangs, at the root of which is secreted the virus, and rudimentary fangs to take the place of the old ones. The mongoos was introduced to exterminate the fer-de-lance, but it has not been successful.

The climate shows three seasons—cool in spring, hot and dry in summer, and hot and wet in autumn and part of winter. There is much humidity. The tropical heat is mitigated by the sea-breezes and fresh winds from the mountains.

The island has no deep harbors, although there are three indentations which afford good shelter. The principal of these is the Bay of Fort-de-France, the capital of the island, and the headquarters of the French admiralty in the West Indies. On the

south side are the Grande Anse du Diamante and the Bay du Marin; on the west there are several other small coves. The eastern side is a dangerous shore, where the Atlantic breakers roar and foam in a grand and indescribable surf, which prohibits approach to land.

Martinique is now a favored colony of France, constituting a department of the republic, with a governor and excellent administration, sending a senator and two deputies to the National Assembly at Paris.

The food-stuffs of the United States are absolutely necessary to the life of the colony, but the United States takes almost nothing from Martinique in return. Sugar, coffee, cocoa, tobacco, cotton, and rum are the principal products, and all the plantations producing these are in a flourishing state in comparison to those of the adjacent British islands. There are upward of five hundred ordinary sugar works.

MONEY EMPLOYED FOR EDUCATION.

One-fourth the revenue of the island ($1,342.000) is devoted to education. There is a law school at Fort-de-France. There are three secondary schools, with five hundred pupils; a normal school; thirty-eight primary schools, with ten thousand pupils; and thirteen clerical and private schools. There are also two government hospitals, military and civil, and the charge for a native in the last is twenty-five cents a day. At the two prisons the discipline is very mild. France also encourages agriculture by giving a bounty of ten cents for every coffee and cocoa-tree. This is to prevent the exclusive cultivation of the sugar-cane.

There is also a colonial bank, the object of which is to assist the planters; experts determine the value of the crops, and the bank advances one-third their value. If the obligation is not met by the crops, the bank carries over its claim on the valuation of the next year's crop.

An excellent system of highways has reduced the difficulty of traveling across the rugged island. Transportation is also carried on by small coasting-vessels, although on the eastern side

of the island this is especially difficult, as the cargoes have to be carried through the surf on the backs of men, or pushed by swimming negroes in small boats through the water.

France has always nurtured this colony with a tender, loving hand, giving it the best of administrations, helping it freely when in distress, and protecting its industries whenever possible.

The large towns are St. Pierre and Fort-de-France, on the leeward side, and Grande Anse, on the windward shore. St. Pierre on the west side, is the principal city. It is built on cliffs overlooking the bay of the same name, which is nothing more than a very slight curve in the shore-line, vessels having to anchor in the open roadstead. It is a picturesque and beautiful place, with neat public buildings and an interesting creole population. The town has a handsome cathedral and other public buildings.

SUBSTANTIAL APPEARANCE OF THE TOWN.

The town has an aspect of great solidity, looking as if it had been hewn out of one mountain fragment instead of constructed stone by stone. Although commonly consisting of only two stories and an attic, the dwellings have walls three feet in thickness. There are also many fountains throughout the city, carrying drinking water, which comes from another source than that of the water in the gutters. The main street is known as Rue Victor Hugo.

St. Pierre has many images and some fine statues. One of the latter, standing on a height and easily visible from the sea, is a gigantic "Christ," which overlooks the bay; a great white "Virgin" surmounts the Morne d'Orange, to the south of the city while "Our Mother of the Watch" overlooks the anchorage. There is a great white cathedral with a superb chime of bells. Behind the city is a beautiful cemetery.

The market of St. Pierre is most picturesque. It is in the middle of a square surrounding a fountain, and filled with countrywomen dressed in gorgeous Oriental colors, selling their little products—oranges, bananas, vanilla beans, cocoa—while the fishermen lift their boats bodily out of the water and convert them into

stalls, where can be seen a most wonderful fish display, rivaling in colors the tints of the rainbow, and having a hundred queer French names, which it is useless to repeat here, such as the Bon Dié manie moin ("The good God handle me"), etc.

A fine road leads from St. Pierre to the village of Mon Rouge, situated two thousand feet above the sea. In the village is a shrine to the Virgin, which is visited by the inhabitants. Along this road are many shrines and little chapels with crucifixes and statues, with lamps burning before them. This road leads by the beautiful botanical garden, and passes many fine and solid stone bridges.

MILITARY CENTRE AND ARSENAL.

The capital, Fort-de-France, formerly Fort Royal, is situated on a beautiful but shallow bay near the south end of the west side of the island. The town, though secondary in commercial importance to St. Pierre, is the military center and arsenal of the French Antilles, the rendezvous of the navy, the terminus of the French transatlantic steamships and West Indian cable system. It was half ruined by an earthquake in 1839, and nearly consumed by a fire in 1890. After the last event the inhabitants offered a bounty of fifty per cent. of the value of the old buildings to help rebuild, and eight hundred thousand dollars were thus spent. Among the several interesting statues adorning its public gardens the most noted is that of the Empress Josephine, erected by the people of the island in honor of her nativity. She was born in Martinique.

Throughout the island there are many little villages, such as Le Montine, Petit Bourg, Le Francois. Grande Anse is situated across the high mountain ranges, and is reached by a picturesque road from St. Pierre, which rises into the higher passes, and is shaded by tree-ferns, accompanied by graceful bamboo and arborescent grass. It is in a region of black stones, out of which the houses are built.

Black volcanic boulders dot the hillsides, and even the sands of the beach are black, and full of valuable magnetic iron. The

village is a small place, principally noted for the wonderful expertness of its men in swimming the breakers, and for the beauty of its female "porteuses"—young girls who carry burdens upon their heads. At Diamond Rock there is the tomb of the commander of one of the English ships, and the remains of the cistern which furnished the English with water while the rock was fortified by them in 1844.

Not less interesting than the natural features are the inhabitants of this island, distinguished by beauty, thrift, and a remarkable and peculiar individuality. Most of them were either blacks or members of that remarkable mixed race which distinguishes the island. The mixed populations show every variety of color and type—mulattoes, copre, chabin, and mates—but they are generally healty and thriving. Traces of Caribbean blood are seen in their color, physiognomy, and physical characteristics.

ISLAND OF ST. VINCENT.

St. Vincent is a single island with no outlying rocks or islets. It is seventeen miles long and ten miles broad, with an area of one hundred and thirty-one square miles, and a population of nearly fifty thousand people. A ridge of mountains passes along the middle through its whole length, the highest of which, the Soufriére, is at the north extremity. Its scenery is slightly different from that of other Caribbees. There are more extensive open views —slopes and valleys—while vast areas of more recent cinder and lava indicate that later volcanic action has taken place.

The island culminates in the vast crater of Morne Garou, which was the scene of a tremendous eruption in 1812, when the earthquakes which for two years had terrified the West Indian region and the South American coast culminated in an explosion which was a most devastating and far reaching cataclysm, being rivaled within recent years only by the explosion of Krakatau, in the Straits of Sunda. In Caracas ten thousand people were buried in a single moment, and ruin was wrought along the entire line of the Andes by earthquakes accompanying the event.

The Soufriere of St. Vincent vomited vast clouds of dust,

which darkened the sun for an entire day and spread over one hundred miles of sea and land. This eruption changed the configuration of the island and destroyed its eastern end. The present crater, formed at that time, is a half-mile in diameter and five hundred feet deep, and is now a beautiful lake walled in by ragged cliffs to a height of eight hundred feet. Since 1812 the volcanic forces have been quiescent, until the late eruption, and nature had made the island more beautiful than ever.

Kingstown, the capital, with about eight thousand inhabitants is on the southwest side, the town stretching along a lovely bay, with mountains gradually rising behind in the form of an amphitheatre Its red-roofed houses and a few fine stone structures show picturesquely through the palm groves. Behind these are the governor's house and botanical buildings, overlooking the town. Three streets, broad and lined with good houses, front the water. On these are stone buildings occupied as a police station and government stores. There are many other intersecting highways, some of which lead back to the foot-hills, from which good roads ascend the mountains.

DECAY OF THE SUGAR INDUSTRY.

In St. Vincent we meet the same story of the decay of the sugar industry; here it is on the verge of extinction No improvements have been introduced in the manufacture, and the canes have in recent years suffered severely from disease. No industry has taken its place. Arrowroot is next in importance to the sugar, but its price has also declined, adding to the depression. It is grown in fields which are planted like Indian corn when sown for fodder.

When matured it is dug up and taken to a mill, where the roots are broken off, ground, washed, and strained, and the mass allowed to settle for a few days. The product is then placed on wire frames with different-sized meshes to dry. It gradually shifts down through these, and is then barreled for shipment. In recent years it has brought about five dollars a barrel, or eight cents per pound; formerly it brought from forty to sixty cents.

Wages are very low and constantly being reduced, and there

is a lamentable want of employment even at the price of less than twenty-five cents a day for able-bodied men, who are constantly emigrating, leaving the women and children to shift for themselves. There are few Caribs remaining in St. Vincent, the remnant of a large number that lived here until 1796, when Great Britain deported five thousand of them to the coast of Honduras.

Between St. Vincent and Granada, instead of open water, we find several hundred little rocky islands, all disposed in the trend of the larger Caribbees, but offering an endless variety in shape and configuration. Kingsley has summarized their essential features as follows :

On leaving St. Vincent, the track lies past the Grenadines. For sixty miles, long low islands of quaint forms and euphonious names—Becquia, Mustique, Canonau, Carriacou, Ile de Rhone—rise a few hundred feet out of the unfathomable sea, bare of wood, edged with cliffs and streaks of red and gray rock, resembling, says Dr. Davy, the Cyclades of the Grecian Archipelago; their number is counted at three hundred. The largest of them all is not eight thousand acres in extent, the smallest about six hundred.

STOCK FOR EXPORTATION.

A quiet, prosperous race of little yeomen, besides a few planters, dwell there ; the latter feeding and exporting much stock, the former much provisions, and both troubling themselves less than of yore with sugar and cotton. They build coasting vessels, and trade with them to the larger islands; and they might be, it is said, if they chose, much richer than they are—if that be any good to them.

The steamer does not stop at any of these little sea-hermitages, so that we could only watch their shores; and they were worth watching. They had been, plainly, sea-gnawn for countless ages, and may, at some remote time, have been all joined in one long ragged chine of hills, the highest about one thousand feet. They seem to be, for the most part, made up of marls and limestones, with trap-dikes and other igneous matters here and there.

And one could not help entertaining the fancy that they were

a specimen of what the other islands were once, or at least would have been now, had not each of them had its volcanic vents to pile up hard lavas thousands of feet aloft, above the marine strata, and so consolidate each ragged chine of submerged mountain into one solid conical island, like St. Vincent at their northern end, and at their southern end that beautiful Grenada to which we were fast approaching, and which we reached, on our outward voyage, at nightfall, running in toward a narrow gap of moon-lit cliffs, beyond which we could discern the lights of a town.

CHAPTER II.

GRAPHIC ACCOUNTS OF THE GREAT DISASTER.—TRAGEDY COMPLETED IN THE BRIEF SPACE OF A FEW MINUTES.—DESPATCHES FROM UNITED STATES OFFICIALS.—VOLCANIC ISLANDS DESCRIBED.—URGENT APPEALS FOR HELP.

NO such appalling disaster, distinguised by the suddenness of the blow, the number of the victims, the completeness of the desolation, has ever come to the civilized world with such overwhelming and harrowing force. The destruction of Pompii is equaled by this greatest volcanic eruption of modern times. Nearly fifty thousand souls sent instantly to eternity. All accounts agree that only a few minutes were required to overwhelm St. Pierre with fiery cinders and ashes, consuming the entire population not only of this city, but of a large section of the surrounding country. The first reports of the disaster were almost too incredible to be believed.

The following graphic accounts were among the first received:

The French cruiser Suchet arrived at Point-a-Pitre, Island of Guadeloupe, French West Indies, from Port-de-France, on the morning of May 9th, bringing several refugees. She confirmed the report that the town of St. Pierre, Martinique, was entirely destroyed at 8 o'clock on Thursday morning of May 8th by a volcanic eruption.

The commander of the Suchet reported that at 1 o'clock on May 8th, the entire town of St. Pierre was wrapped in flames. He endeavored to save about thirty persons, burned from the vessels in the harbor. His officers went ashore in small boats seeking for survivors, but were unable to penetrate the town. They saw heaps of bodies upon the wharves, and it is believed that not a single person in St. Pierre at the moment of the catastrophe escaped.

The Governor of the colony was but recently in St. Pierre

The extent of the catastrophe cannot be imagined. The captain of the Britsh steamer Roddam was very seriously injured. All of his officers and engineers are dead. Nearly every member of the crew is dead. The supercargo and ten of the crew of the Roddam jumped overboard at St. Peirre and were lost.

The British Royal Mail steamer Esk, which arrived at St. Lucia on the morning of May 9th, reported having passed St. Pierre the night before. The steamer was covered with ashes, though she was five miles distant from the town, which was in impenetrable darkness. A boat was sent in as near as possible to the shore, but not a living soul was seen ashore. Only flames were seen. The Quebec Steamship Company's steamer Roraima was seen to explode and disappear.

HAD TO FLEE FROM ST. VINCENT.

The British schooner Ocean Traveler, of St. John, N. B., arrived at the Island of Dominica, British West Indies, at 3 o'clock in the afternoon. She reported having been obliged to flee from the island of St. Vincent, British West Indies, during the afternoon of Wednesday, May 7th, in consequence of a heavy fall of sand from a volcano which was erupting there. She tried to reach the island of St. Lucia, British West Indies, but adverse currents prevented her from so doing. The schooner arrived opposite St. Pierre, Martinique, Thursday morning, May 8th. While several miles off, the volcano of Mont Pelée exploded, and fire from it swept the whole town of St. Pierre, destroying the town and the shipping there, including the cable repair ship Grappler, of the West India and Panama Telegraph Company, of London, which was engaged in repairing the cable near the Guerin factories. The Ocean Traveler while on her way to Dominica encountered a quantity of wreckage.

The cable officials at San Juan, Porto Rico, received advices from the Island of Dominica that a schooner which arrived there from the Island of Martinique reported that more than forty thousand people were supposed to have perished during the volcanic disturbance in Martinique. The cable repair steamer Grappler

belonging to the West India and Panama Telegraph Company, of London, was lost with all hands during the eruption of Mont Pelée. The Grappler was one of the first ships to disappear.

The following despatch was sent out from Washington on Friday evening, May 9th:

"Washington is appalled to-night by the catastrophe that has stricken Martinique. According to official advices but thirty persons out of twenty-five thousand survive from nature's destruction of the city of St. Pierre. The administration is still in ignorance of the effect of the earthquake upon other sections of the island, which had a population of 165,000.

"Further seismic disturbances are apprehended, and fears are entertained that some of the American possessions, including St. Thomas and St. Johns, which are practically the property of the United States, may be affected.

DESPATCH FROM OUR CONSUL.

"Secretary Hay received this afternoon this dispatch from Consul Louis H. Ayme, stationed at Pointe-a-Pitre, Guadaloupe:

"'Secretary of State, Washington:

"'At 7 o'clock A. M. on the 8th instant, a storm of steam, mud and fire enveloped the city and roadstead at St. Pierre, destroying every house in the city and community. Not more than thirty persons escaped with their lives. Eighteen vessels were burned and sunk with all on board, including four American vessels, and a steamer from Quebec, named Roraima. The United States Consul and family are reported among the victims. A war vessel has come to Guadeloupe for provisions, and will leave at 5 to-morrow. "'(Signed) AYME, Consul.'

"This dispatch reached the State Department yesterday from Consul Ayme:

"Secretary of State, Washington:

"'Communication with Martinique by telegraph interrupted. Unable to communicate with the island. According to informa-

tion I received a great many people are killed there by an earthquake. Frequent earthquakes in Guadeloupe.

"'(Signed) AYME, Consul.'

"Appeals were received by the State Department from persons living in New York, who have relatives and interests in Martinique that war ships be immediately dispatched to the island to render assistance. Secretary Moody and Rear Admiral Taylor considered this morning the advisability of ordering a vessel to St. Pierre, but it was decided not to take action until the full extent of the disaster was known.

"The ocean-going tug Potomac, stationed at San Juan, was ordered to sail for St. Pierre. She is under the command of Lieutenant B. B. McCormick. The only other vessel the United States has in or near the Caribbean Sea are the Cincinnati, which is at Santo Domingo; the Yankton, at Cienfuegos, and the Eagle and Vixen, at Havana."

DESTROYED BY STORM OF FIRE.

A despatch from Paris stated that the commander of the French cruiser Suchet telegraphed to the Minister of Marine, M. de Lanessan, from Fort-de-France, Island of Martinique, under date of Thursday, May 8, at 10 P. M., as follows:

"Have just returned from St. Pierre, which has been completely destroyed by an immense mass of fire, which fell on the town at about eight in the morning. The entire population, about twenty-five thousand, is supposed to have perished. I have brought back the few survivors, about thirty. All the shipping in the harbor has been destroyed by fire. The eruption continues."

The commander of the Suchet, at Fort-de-France, was ordered to return to St. Pierre, Martinique, with all the speed possible, and to forward details of the disaster to the French Government The Suchet had gone to the island of Guadeloupe in order to obtain provisions. It was feared that M. L. Mouttet, the Governor of Martinique, had perished. He telegraphed May 7 that he was proceeding to St. Pierre. Senator Knight is also supposed to have been at St. Pierre.

The Colonial Minister, M. Decrais, received at 6 o'clock in the evening two cable messages from the Secretary General of Martinique, J. E. G. l'Huerre, sent respectively at 5 and half-past 10 o'clock. The earlier cable reported that the wires were broken down between Fort-de-France and St. Pierre, but it was added that in view of reports that the eruption of Mont Pelée had wiped out the town of St. Pierre all the boats available at Fort-de-France had been despatched to the assistance of the inhabitants of that place. The second despatch confirmed the reports of the destruction of St. Pierre and its environs and shipping by a rain of fire, and said it was supposed that the whole population had been annihilated, with the exception of a few injured persons rescued by the cruiser Suchet.

INCIDENTS OF THE CALAMITY.

Immediately after the receipt of the above despatches the flag over the Colonial Office was draped with crape and hoisted at half-mast, M. Bouguenot, a sugar planter of the island of Martinique, received a cable despatch from Fort-de-France, sent by the manager of the Francais Factory, announcing that he had "tried to reach St. Pierre, but found the coast covered with ashes and the town enveloped in dust, and could not land." Senator Knight, who is referred to in the despatch from Paris as having probably been at St. Pierre at the time of the disaster, is the President of the General Council, or local legislative body of the island of Martinique.

On May 9th United States Consul Ayme cabled the State Department from Guadeloupe that great consternation prevailed in that locality in consequence of earthquakes and volcanic activity. Loud noises were heard continuously, which were ascribed to volcanic action. Telegraphic communication with Martinique was broken in every direction. He was informed that many thousands of people had been killed in and about Martinique.

Thomas T. Prentis was the Consul and Amedee Testart the Vice Consul at St. Pierre. Mr. Prentis was born in Michigan, and appointed into the consular service from Massachusetts. Mr.

Testart was born in and appointed Vice Consul from Louisiana. Mr. Prentis was about sixty years old. He entered the consular service in 1871, when he was appointed Consul at the Seychelles Islands. He was appointed Consul at Mauritus on March 29, 1880, and retired in 1894. He was appointed Consul at Rouen, France, on January 11, 1900; in May of the same year he was transferred to Batavia, and six months later was sent to Martinique. Mr. Testart entered the service in 1898.

Colonel Louis H. Ayme, United States Consul at Guadeloupe, was, so far as known, the one American in a position to be most fully informed regarding the catastrophe in Martinique. He was not only not far from the stricken island, but is familiar with it through several trips he has made there during his consulateship at Gaudeloupe.

IN AN AGONY OF SUSPENSE.

Colonel Ayme has spent much of his time during the last twenty years in Central America and the West Indies. A few years after his graduation in 1874, from Columbia University, he was appointed Consul at Merida, Yucatan, a post he held until 1884. He then made the collection of antiquities in the States of Southern Mexico which bears his name in the Smithsonian Institute.

New Yorkers who have friends or relatives in St. Pierre passed yesterday in an agony of suspense. One of these was Ferdinand Chatenay, an employé of the Seaboard National Bank. Mr. Chatenay was born in St. Pierre and lived there for sixteen years, before he came to New York. His father, Aristide Chatenay, is the superintendent of a large sugar estate on the island of Guadeloupe, but his mother and two sisters continued to live in their old home in St. Pierre, where young Mr. Chatenay visited them from time to time. From one such visit he had only recently returned. What their fate has been the son and brother could only imagine.

Wholly unfitted for his duties, he sat eagerly scanning the cable despatches in the newspapers, trying to find a ray of hope

from the doomed city. In the absence of details he found little encouragement.

"If the ruin was caused chiefly by a tidal wave," said Mr. Chatenay, "my family and many others may have escaped. They lived at almost the extreme upper end of the residential section, which is known as 'the new town.' It lies about two hundred metres or more than six hundred feet above the level of the old town, which lies along the shore of the roadstead and runs back thence to the foot of the cliffs. On the high slopes of the new town cluster many of the most attractive villas of the well-to-do residents of St. Pierre.

"If the greatest danger had been that of inundation persons living several hundred feet above the sea would have had a fair chance to escape, but I see that some of the despatches describe the calamity as the descent of a great mass of fire and burning lava. The fact that steamships lying anchored in the roadstead were smothered and seared under the fiery shower leaves me little ground to hope that those on the higher slopes could have saved their lives. Indeed, as they were just that much nearer the volcano's crater, their peril was proportionately greater."

PUBLIC BUILDINGS IN ST. PIERRE.

In the old city, which extends along the curve of the shore and runs back to the highlands, were concentrated nearly all the commercial establishments—the banks, public buildings and structures of greatest importance. From the shore line back to the heart of this section is hardly more than 300 yards. In this quarter are located the Custom House, the British and American Consulates, the Chamber of Commerce, the Episcopal residence of the Bishop of Martinique, the military barracks, big enough to accommodate two thousand soldiers, but not now garrisoned since the military and naval base of the island is at Fort-de-France. Here too were the Treasury Department, the Military Hospital, the Banque de la Martinique, the Banque Transatlantique, the Colonial Bank of London and the Credit Foncier Colonial. This was a busy centre, a prosperous little city of 25,000 inhabitants.

St. Pierre was the wealthiest city of the Windward Islands in proportion to its population. Among its prosperous industries were about fifty rum distilleries, each with an output of from five hundred to five thousand quarts daily. Another big concern was the Tonne le Rie Mecanique, a great cooperage factory, representing an investment of not less than $500,000. Sugar cane was grown extensively throughout the island and there were about thirty central factories the largest of which ground an annual output of about one million tons of cane. Nearly all the big distilleries were owned by H. Berté, a wealthy Frenchman. He lives in Ponce, but most of his business interests centred in Martinique.

RICH WITH COCOA GROVES.

In the northern part of the island all the valleys sloping down from the mountains were rich with cocoa groves, the humid moisture of the lower lands being admirably adapted to the cocoa industry, which had come to be one of the most important on the island. It requires three years to grow a crop of cocoa, but once the grove is started in a good damp soil it becomes a very profitable investment. These cocoa trees are all destroyed, as the valleys were the natural course of the fiery flood in finding its way down toward the shore. Eight miles back from St. Pierre, on the very slope of Mont Pelée, and not more than one thousand five hundred yards from the crater of the volcano, which destroyed the city, lies the fashionable summer resort colony of Morne Rouge.

Here were the favorite villas of the rich men of Martinique, and very beautiful many of them were. The charming little suburb had a summer population of about four or five thousand. Its altitude made it delightfully cool, and in the warmest months it was always popular. In 1891 it was ravaged by the great cyclone that devastated the island, but it had been restored and rebuilt more attractively than ever. Many of the handsome summer homes are not generally occupied before June, but others are tenanted early in May.

Mr. Chisholm, the purser of the Quebec line steamship Fontabelle, saw the smoke of what must have been the preliminary

eruption when the ship lay at anchor at Dominica, April 25, and called the attention of the passengers to it, but it was supposed to be probably from a forest fire on the mountains.

R. T. Dorn, of the French West Indian trading department of the American Trading Company, gave a roster of important commercial concerns in Martinique, in addition to those named by Mr. Chatenay. They were all so situated that there is little hope that any of them escaped ruin. They are :—Pilsarmer & Co., agents for the Quebec Steamship Company ; De Garagorri & J. Savon, cooperage firm ; Bard Fessila, St. Leyer, Lalun & Co. ; Riaisemenyl & Co., Gaston, Clarris & Co. ; T. Knight & Fils, Aine & Co., Lassarres Freres, De Maissias & Freres.

ACCOUNT OF VOLCANIC EXPLOSIONS.

Professor Robert T. Hill, of the United States Geological Survey, and Geologist of the Agassiz West Indian Expedition, furnishes the following account of the West India Islands and the volcanic explosions which frequently occur :

Across the throat of the Caribbean extends a chain of islands (the Caribbees), which are really smouldering furnaces, with fires banked up, ever ready to break forth at some unexpected and inopportune moment. This group, commencing with Saba, on the north, near our own Puerto Rica, and ending with Grenada, on the south, near Trinidad, consists of ancient ash heaps, piled up in times past by volcanic action. These old ash heaps have weathered into fertile soil, which, bathed by an undue share of moisture, has become covered with ripe growths of damp and mouldering vegetation. This same soil also produces all the richest vegetable products of the tropics.

These volcanic islands have been slowly piling up since the beginning of the Tertiary Period, and their bases extend beneath the waters for a depth as great as their summits project above it, making their total height nearly ten thousand feet above the submerged bases.

The northern islands of the necklace, like Saa and St. Eustatius, are simple crater cones, but the centre of the chain con-

sists of four larger islands—Guadeloupe, Dominica, San Lucia and St. Vincent—each of which is a complicated mass of old volcanic vents, whose peaks attain their greatest height in Mount Dioblotim, in Dominica, 4,747 feet above the sea.

These volcanoes do not conform to the type which most people have in mind, for from them there flow no fiery streams of lava, nor do they always give days of warning before their outbreaks. On the other hand, their eruptions consist of hot water, cinders and mud. Their explosions come with terrific suddenness and when least expected. In volcanoes which eject lava, the ascending column of molten liquid vibrates the earth for days or months before it reaches the surface, and the people of the vicinity can always foretell the eruptions. This is not so with the cinder type, for they explode suddenly and do their damage without much warnig.

ERUPTIONS AT LONG INTERVALS.

While the explosions by which the mud and cinder were ejected have been sudden, they have taken place only at long intervals of time, each one adding its pile to the surface débris and obliterating the previous landscape.

It had been so long since any explosions occurred that most geographers, as well as the inhabitants of the island, had considered that the forces which produced them were spent, and classified them as extinct volcanoes. It is true that the Soufriere of Gaudeloupe, has sent up from its summit from time immemorial faint puffs of steam, and that upon Dominica and other of the islands there were a few hot springs, but for nearly a hundred years there had not been the least sign of explosion. There is also an old crater or soufriere on the Island of St. Lucia which contains some boiling springs.

Within human history there has been but one serious eruption in the Caribbee Islands, but this, like the present catastrophe, was one of the most destructive the world had ever seen. In 1812, the mountain of Morne Garon, on the island of St. Vincent which is south of Martinique, exploded. The explosion was a most

fatal and far reaching cataclysm, being equalled in recent years only by that of Krakatoa, in the Straits of Sunda. In Caracas, ten thousand persons were buried in a single moment, and after this event ruin was wrought all along the line of the Andes by earthquakes.

Morne Garon vomited vast clouds of dust, which darkened the sun for an entire day and spread over a hundred miles of sea and land. The volumes of mud changed the configuration of the island, as well as its eastern end. The present crater, formed at that time, is half a mile in diameter and five hundred feet deep, and is now a beautiful lake, walled in by rocky cliffs to a height of eight hundred feet. Its slopes are covered with peaceful vegetation and fields of cane.

The island of Martinique is composed almost entirely of old volcanic material, and is dominated by three conspicuous peaks, which have probably been volcanic in the past. Mount Pelée is the highest of these, and dominates the northern end of the island. Near the center of the island is Carbet, 3,960 feet in height, and near the southwestern end, Vauclin, 1,657 feet.

QUIET AND ATTRACTIVE TOWN.

In a peaceful bight behind the sheltering slopes of Pelée lay St. Pierre. The city, with its 25,000 inhabitants, isolated from the rest of the island and the world, except by the call of an occasional passing steamer, led a tranquil and quiet existence. So narrow was the sloping beach upon which it was situated that there was hardly room for its population, crowded in houses of antique pattern, built in old French colonial days. The streets were paved with cobble stone, and through each gutter flowed a quiet stream of mountain water. The inhabitants were almost entirely Martiniques, that queer race composed of a mixture of African, French and Carib blood, noted for its beauty and its misfortunes.

Hurricanes, plague, misgovernment and the French-English wars played frequent havoc with these people, but the calamity resulting from the explosion of Mont Pelée is one of which they

never dreamed. They had looked upon its verdure clad slopes only as the home of the sprites and goblins which abound in their peculiar folk lore, and of the dreaded Fer-de-Lance, the most fatal serpent in existence, which inhabits only this island and San Lucia.

What happened at Mont Pelée was probably this: A gigantic explosion of steam and gas, accompanied by a shower of red hot cinders, which, falling upon the homes and shipping, burned and partially buried them. Volcanism is still one of the most inexplicable and profound problems, which defies the power of geologists to explain, and one of its most singular peculiarities is the fact that it sometimes breaks forth simultaneously in widely distant portions of the earth.

A sympathetic relation of this kind has long been known between Hecla and Vesuvius, and it is very probable that the Carib volcanoes have some such sympathetic relation with the volcanoes of Central America and Southern Mexico. At the time of the explosion of St. Vincent other explosions preceded or followed it in northern South America and Central America.

MANY VOLCANIC DISTURBANCES.

The present outburst of Mont Pelée, in Martinique, is apparently the culmination of a number of recent volcanic disturbances which have been unusually severe. Colima, in Mexico, was in eruption but a few months ago, while Chelpancingo, the capital of the State of Guerrero, was nearly destroyed by earthquakes which followed. Only recently the cities of Gautemala were shaken down by tremendous earthquakes. When news can be received from the inaccessible interior of Central America, it will probably be learned that some of the numerous volcanic summits of that region have exploded. Although widely distant, there seems to be a geological relation between the Caribbean and the Central American volcanic chains.

The whole region of the American Mediterranean, instead of being a body of water, as it appears on the maps, is looked upon by geologists as a great east and west mountain system, whose

ridges, except the great Antilles, are submerged beneath the waters, where profound valleys and submerged mountain crests are found between the banks and depths. This Antillean mountain system suddenly terminates at each end to the east and west, with lines of great volcanoes running at right angles to it. These are the volcanic chains of Central America and of the Caribbean Islands.

It is a singular fact that both these volcanic chains are of the peculiar type which erupt cinders and mud, and it certainly appears as if there was some sympathetic relation between them.

Professor Milne, of Chicago, the highest authority in the world on volcanic explosions, classifies eruptions into two grades—those that build up very slowly and those that destroy most rapidly.

HOW MOUNTAINS ARE FORMED.

Eruptions that build up mountains are periodical wellings over of lava and comparatively harmless, but in the building up, which may cover a period of centuries, natural volcanic vents are closed up, and gases and blazing fires accumulate beneath that must eventually find the air. Sooner or later they must burst forth, and the terrific disasters of the second class take place. It is the same cause that makes a boiler burst.

In 1883 Asama of Japan exploded. It was one of the most frightful eruptions of modern times. It came down eight thousand feet, a torrent of mud and fire, five to ten miles broad, which overwhelmed forty-two villages. Historians have never been able to determine how many lives were actually lost by this explosion, but the total ran into thousands.

Bandaisan of Japan blew up on July 15, 1888, and sent 164,000,000 yards of rock and earth into the valley beneath. The lava stream from its head travelled at the rate of forty-eight miles an hour and was a hundred feet deep. Its width was five to fifteen miles, but only 401 persons lost their lives.

The greatest volcanic explosion ever known was that of Krakatoa, an island in the Straits of Sunda, between Java and Sumatra. The eruption began on May 20, 1883, but the great

explosion did not come until August 26. The flames from the crater could be seen forty miles distant. The crashing explosion which followed the flames set in motion air waves that travelled around the earth four times one way and three times the other. Every self-recording barometer in the world was disturbed seven times by that blow up. These waves travelled at the rate of 700 miles per hour.

The noise of this eruption was heard at Borneo, 1160 miles distant. It was felt in Burmah, 1478 miles distant, and at Perth West, Australia, 1902 miles away. The explosion was heard over a sound zone covering one-thirteenth of the earth's surface.

IMMENSE SEA WAVES.

Sea waves were created by the explosion, which destroyed all the towns and villages on the shores of Java and Sumatra bordering the strait, all vessels and shipping there and 36,380 lives; raised a tidal wave at Merak one hundred and thirty-five feet high, covering five hundred thousand square miles of ocean with lava dust several inches thick, submerged an island six miles square and seven hundred feet high to a depth of one hundred and fifty fathoms, and created two new islands.

Professor Milne was asked after Krakatoa's performance:—

"Is it likely that there are volcanoes in the world at present that have been quiet for a long time, but will one day or another blow their heads off?"

"It is almost certain there are."

"Some in Europe?"

"Many in Europe."

"Some in the United States?"

"Undoubtedly."

Professor Hill's prediction that intelligence would be received of earthquakes in South America was fully verified. The steamship Newport, from Panama, and way ports, was at La Libertad on the night of April 18, 1902, when the Republic of Guatemala was shaken from end to end by a series of earthquakes. The shock was felt aboard the Newport, but it was not until Ocos was

reached that those on the steamship had any idea of the seriousness of the situation further inland. According to cablegrams received here and reports heard in Ocos by the officers of the Newport the damage was terrific and the loss of life large.

In Ocos itself there was more than enough evidence of the frightful convulsion that had swept the land and left death and destruction in its path. The land upon which Ocos stands was converted by the subterranean disturbance into a chaotic condition. The earth rolled up in three distinct waves, which still rear their crests where they stood when the convulsion ceased. Between each wave is a wide and deep abyss. There is not a house in Ocos left standing. The river banks are squeezed together and the street is now twenty feet narrower than before. The bed of the river gave up the remains of a wreck that disappeared in the mud five years before.

RIVER BANKS CONTRACTED.

When the earthquake came and squeezed the river banks together it forced the wreck from the mud and returned it high and dry. The railroad bridge across the river was telescoped by the contraction of the banks, and the wharf which was Ocos' pride now stands as a monument to the earthquake's ruthless strength, a misshapen mass of badly tangled angles.

Further news of the earthquake has just reached Victoria, B. C., by the British war ship Grafton, which was at San Jose at the time. The officers of the ship say that the city of Escuintla, capital of the Guatemalan province of the same name, was almost completely destroyed. The shock was only felt for forty seconds at Guatemala City.

At Escuintla the shock was felt for about two minutes and houses were cracked and destroyed. Hundreds of persons were buried in the ruins and struck by the falling timbers and stones. The loss of life was variously estimated at from three thousand to five thousand in the city of Escuintla, according to some reports published in San Jose, but some of the merchants engaged in business there said that they had advices from the wrecked dis-

SCENE IN THE CENTRE OF THE RUINED CITY

THE HORRORS OF THE SCENE—THE TERRIBLE REALITIES OF DEATH—ARE ALL SHOWN IN THE PICTURE WHICH TELLS THE STORY OF THE VOLCANO'S WORK

THE DESOLATION OF ST. PIERRE

IN THE DISTANCE CAN BE SEEN THE MILITARY HOSPITAL.

COPYRIGHT, 1902, BY J. MARTIN MILLER

SCENE IN ST. PIERRE AFTER THE ERUPTION ON MAY 8TH

COPYRIGHT, 1902, BY J. MARTIN MILLER

SEARCHING FOR DEAD BODIES AMONG THE WRECKAGE AT ST. PIERRE

A WOMAN OF MARTINIQUE IN THE HEAD-DRESS PECULIAR TO THE FRENCH WEST INDIES

SCENE IN POMPEII—SHOWING EXCAVATED STREET

COPYRIGHT, 1902, BY J. MARTIN MILLER

SCENE OF THE TERRIBLE CALAMITY IN MARTINIQUE WHICH CAUSED THE DESTRUCTION OF ST. PIERRE

COPYRIGHT, 1902, BY J. MARTIN MILLER

THE CRATER OF MOUNT SOUFRIERE, ST. VINCENT, THE ERUPTION OF WHICH DEVASTATED MUCH OF THAT ISLAND

trict which placed the death list at from one thousand to fifteen hundred.

The city of Escuintla had a population of about ten thousand before the shock which cut ravines in the fields and shook many of the houses to wreck.

According to stories in San Jose after the earthquake, the scenes in Escuintla and some of the other cities of that province which suffered the most, were terrible.

In San Jose, the capital of the central province of Guatemala, a thousand buildings were destroyed by the earthquake and three persons were killed. Travellers coming into the city reported that the railway had been much damaged and progress was difficult, for the embankment had been badly cracked and the rails spread in many places.

TRAGIC STORIES OF DEATH.

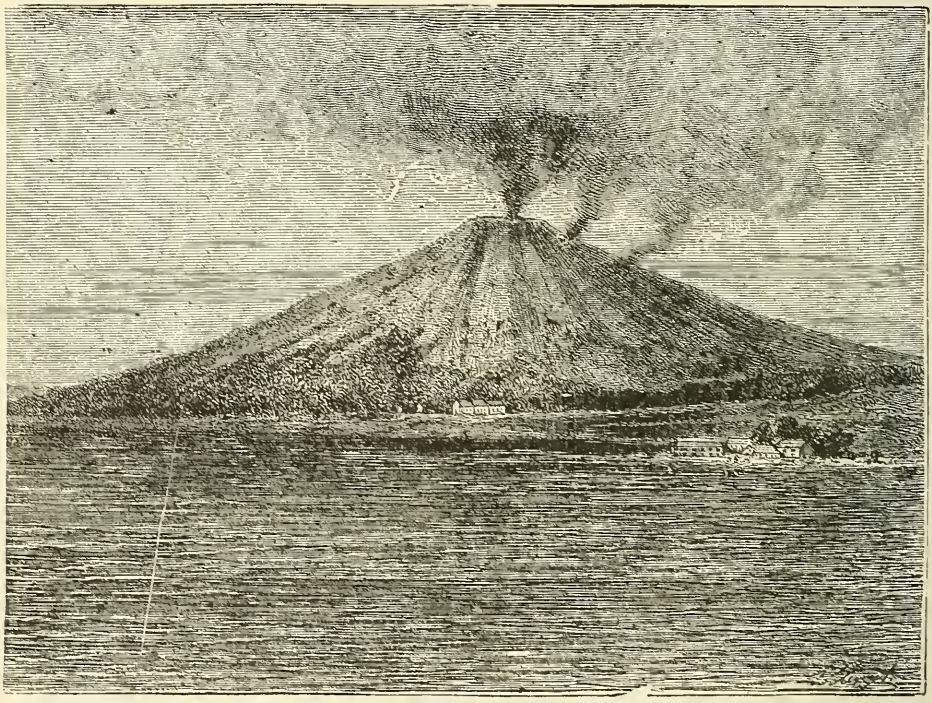
The stories of death and destitution were coming into San Jose from all sides before the Grafton sailed from there, two days after the earthquake, the worst stories being received from Escuintla, which province suffered the most.

The following comments by a well-known journal express the horror shared by the general public and their sympathy for the survivors of the terrible calamity :

"In the Western Hemisphere, during the historic period, no convulsion of nature comparable to the current West Indian catyclysm has occurred since the protracted series of volcanic and seismic disturbances which culminated, in 1812, in the destruction of Caracas, the Venezuelan capital, when 12,000 lives were lost. The entire Caribbean chain of islands is of volcanic origin, and on nearly every one of them are to be found the craters of volcanoes which have never ceased entirely to give indications of unrest. For fully half a century, however, there has been no violent commotion in this quarter of the globe, and the present disastrous disturbances are all the more appalling because of their suddenness.

"Indeed the awful suddennes of the overwhelming disaster in

Martinique gives it pre-eminence among the great catastrophes of which we have record. It impresses upon us the transitoriness of man and the works of man. The tremendous convulsion of nature that produced the ruin with such marvelous swiftness vividly recalls Shakespeare's lines, 'The great globe itself, Yea, all which it inherits, shall yet dissolve.' The destruction of St. Pierre came without premonition, or with such brief warning as to make



MOUNT LA SOUFRIERE, ST. VINCENT, IN ERUPTION.

escape impossible for thousands of the inhabitants of St. Pierre and other towns and villages on the island. The earliest reports of great calamities are often exaggerated, but in the present instance it does not appear as yet that the first estimate of the loss of life was overdrawn. It is certain that nothing that appeals to human pity was lacking in the appalling crisis. The colossal tragedy will arouse the sympathy of the world and efface national boundaries, for nothing that afflicts humanity thus grievously and lamentably can be foreign to us.

"Danger hovers over the cities that lie in the path of the earthquakes or in the shadow of the volcano. Those who live in these cities must face the perils of an environment which is not easily changed. Local attachment is so strong with most men that they will brave great perils of climate or of situation rather than make a new home in a safer location. The people of Pompeii were restoring the city and were living in it after the ravages of an earthquake which visited it a few years before it was finally overwhelmed by the eruption of Vesuvius. It would be a cynical observation to say that the people who live in volcanic regions should seek safer habitations.

"No comment can color in more sombre hues the graphic recital of the news dispatches portraying the scenes and incidents that accompanied the destruction of St. Pierre and that laid waste a large portion of the fair island of Martinique. The eruption of Soufriere, in St. Vincent, was also a serious event. We are told that in Martinique large areas of vegetation have been destroyed, that many are perishing from want of water and food, that famine exists or is impending. Towns and villages were completely engulfed in flames and ashes. The destruction, according to the advices received, was of amazing completeness over a large portion of the island. Great suffering must ensue. Unless despatches are at fault, hundreds are likely to perish before the timeliest succor can relieve them.

"It may be necessary to supply the survivors on the island with food for some time, and to assist them in rehabilitating their affairs to some extent. The French Government has taken steps to aid the islanders at once.

"In the face of such an unusually urgent call we should give wings to our benevolence. The money contributed by the United States, we doubt not, will be judiciously expended, or returned if there should be no demand for its expenditure. It should be immediately available. We have helped the starving people of Russia and other foreign countries; the objectors to the Martinique appropriation do not respect the benevolent impulses of the American people."

L. of C.

CHAPTER III.

MARTINIQUE CITY A HEAP OF SMOKING RUINS.—STREETS FILLED WITH CHARRED BODIES.—LARGE PORTIONS OF THE ISLAND ENGULFED WITH LAVA.—ST. VINCENT ALSO DEVASTATED. RELIEF FOR THE SUFFERERS.

THE outbreak of volcanic activity in the West Indies was preceded by earthquakes and subterranean noises, particularly in Martinique and St. Vincent, for a period of two weeks or more. On Saturday, May 3rd, Mont Pelée, five miles from St. Pierre, began to throw out dense clouds of smoke, followed that night by flames which lighted the sky. This again was succeeded on the following day, May 4th, with a rain of ashes, which covered St. Pierre an inch thick and shut out the volcano from view.

On Monday, May 5, a stream of lava shot down the mountain side with incredible rapidity, reaching the sea, according to one report, a distance of five miles, in three minutes. This swept away plantations, cattle and residents, and covered the Guerin sugar factory, one of the finest in the island. The sea receded and returned in a great wave, but the latter is said to have done no damage. The eruption from Mont Pelée continued, and on the fifth and sixth there was a panic among the inhabitants, many fleeing to the hills, and a few escaping by the sea. The climax was reached on the morning of the eighth, when "a whirlwind of fire," mud and steam swept over St. Pierre and the roadstead, destroying everything in its path. A loud explosion from the Soufriere volcano, in the northern part of the British island of St. Vincent, occurred on Monday, May 5th, and the water in the crater rose in a dense mass of steam. The disturbance increased until Wednesday, when the volcano began belching forth smoke and stones. This was followed later in the day by an overflow of lava, and a dense rain of ashes and dust, which covered the island and was carried many miles across the sea. On Friday there was

a fresh outbreak and ejections of fiery matter, more dust covered the island, in some places to a depth of two feet. Several districts were destroyed by the lava, and great loss of life resulted.

A despatch from St. Lucia, one of the British West Indies, dated May 11th, furnished the following particulars:

"The St. Pierre fire is abating, and the searching parties find bodies in the attitude of life. There is an immense pile of corpses around the site of the Cathedral. Not a living soul has been discovered. There is not a building that has not been destroyed. Heart-rending scenes followed the announcements of the bodies recognized. Most of the city is still burning. Fort-de-France is full of refugees from all over the country. Food is required at once. The most urgent appeals have been sent to neighboring islands, but their stocks are limited.

LOUD THUNDERS AND FIERCE FLAMES.

"St. Vincent's volcano is still in full eruption. Terrific detonations are followed by columns of dense clouds, shooting miles high, with immense tongues of flame. Large stones are falling in the neighborhood of the crater, and pebbles, showers of cinders and ashes rain down thick. Kingston was reported safe by the steamer that arrived this morning, which also reports a large area north of the island as still in flames. It is impossible to estimate the amount of destruction or the loss of life.

"Certainly a great area has been desolated by the lava. There has been a waterspout of the west coast of St. Lucia, about seven miles on the line between St. Vincent and St. Lucia. The volcanoes of St. Lucia and Solfaterra are boiling normally. The sky is now clear and the day full of bright sunshine."

Another despatch from St. Thomas, dated also May 11th, affords additional details:

"Famine now threatens to add its horrors to the situation in Martinique. From the country districts the inhabitants are flocking into Fort-de-France, and all are panic stricken. Food has already become scarce, and the supply depots are under military guard. Terrible suffering can be averted only by the early

arrival of provision ships. St. Pierre had ever served as the storehouse of the entire island. Reserve supplies were kept there, and with the complete destruction of that city starvation became an immediate menace.

"Fort-de-France has been little more than a great military post, so that it is now unable to give more than shelter to the refugees. Showers of hot mud and cinders have served to keep those in Fort-de-France in constant terror, though no actual damage is known to have been done there. Mont Pelée continues in active eruption, though with weakening force.

"The steamer Korona, of the Quebec Line, a sister ship of the Roraima, has carried Mr. Scott, first officer of the Roraima, and eighteen others, saved from the same vessel, to Dominica. The captain reports that on Friday he attempted to force his way with the Korona into the harbor of St. Pierre, but was compelled to give up the attempt owing to the intense heat and smoke which hangs in a dense cloud over the island. He did get close enough to see that Mont Pelée was still active. Numerous half-burned bodies were observed, but none were picked up.

ALL VESSELS DESTROYED.

"Nothing new concerning the original disaster has yet been learned. It is known that eighteen vessels were in the harbor on the morning of May 8, when destruction fell upon St. Pierre. These included four American sailing vessels. All were destroyed, save the Roddam. They were simultaneously swept by the great cloud of flame and sank at anchor. The Roraima would have escaped had the explosion been delayed a few minutes. The ship's anchor was lifted and the engine was ready to start when the vessel was overwhelmed. The sea was transformed into a steaming cauldron, into which the sailors sprang, crazed by their sufferings. Twenty-one cabin passengers lost their lives.

"From St. Vincent have been received meagre reports of the disaster in that island. Warning of the activity of the Soufriere was had on May 7. All that day disaster seemed to fill the air. The skies were heavily overcast, deep thunder was

almost incessant, while lightning of the most vivid nature never ceased to play. From the mountain came the mutterings that sent panic to the hearts of all dwellers on the island. The smoke rose in huge columns and volcanic dust filled the air. At 4 o'clock in the afternoon it was dark as midnight. Richmond Park and the estate of Waliboo were destroyed. Chateau Belair district was covered two feet deep with ashes. Earthquakes were continuous. Kingston seemed to be threatened and fear was upon all.

"The Soufriere did not cease to roar during the night of May 7. Thirty deaths were reported on May 8. Volcanic dust continued falling, giving the entire island of St. Vincent a deep mantle. Reports from Barbadoes and Grenada are that on Thursday the heat was almost unbearable. The sky lowered, until at 3 o'clock darkness was absolute. Distinct reports, like those of great cannons, were heard from the direction of St. Vincent. Ashes fell constantly, making it difficult to live in the open."

HILLS COVERED WITH REFUGEES.

A despatch received in Paris from Fort-de-France, Martinique, said : "All the hills surrounding Le Carbet and Le Pecheur (near St. Pierre) are covered with refugees, to the number of about 5000, who are being taken away gradually. In the meanwhile provisions are being conveyed to them. Of the thirty persons who were originally rescued by the French cruiser Suchet the majority were fearfully burned, and nine died while on their way to the hospital. The corpses which are heaped in the ruins of St. Pierre are not only completely naked, but are frightfully mutilated."

The "Temps," referring to the destruction at St. Pierre, said : "We believe from the information received here from the Island of Martinique (meaning doubtless the official despatches) that the disaster surpasses all that imagination can conceive. The whole northeastern portion of the island is laid waste. Three large communities, exclusive of St. Pierre, have been destroyed. The victims comprise two candidates for to-day's ballotage for members of the Chamber of Deputies."

The Minister of Marine, M. de Lanessan, received a cable

despatch from the commander of the French cruiser Suchet, dated Fort-de-France, Martinique, saying that he conducted a search at St. Pierre. The captain reported that the town was now a mere heap of smoking ruins, under which the victims of the catastrophe were buried. The Suchet was able to convey some of the inhabitants of Le Pecheur to Fort-de-France, but could not reach the northernmost part of the island on account of the dense rain of ashes.

The captain of the Suchet further reported that the Mont Pelée volcano still had a threatening aspect. Subterranean rumblings were still heard, flashes of flame frequently belched from the volcano and stones were thrown out with immense force.

LOSS OF PROMINENT MEN.

A despatch received at the Colonial Office in Paris from Fort-de-France said there was no doubt that Governor Mouttet and the commander of the troops at St. Pierre, Colonel Dain, were dead. The candidates for election to the French Chamber of Deputies who perished at St. Pierre were MM. Percin and Le Clerc. Other despatches confirmed the reports that the American and British Consuls, with their families, perished.

M. Bloch, Inspector of Finance, and M. Labarthe, the Colonial Minister's Secretary, who were despatched by the Government to Martinique, sailed from Brest on board the French cruiser D'Assas, which carried money, provisions, and other stores for the relief of the Martinique sufferers.

A French cable official who went to St. Pierre reported that the company's office had been burned to ashes, and that there was no trace of the staff. This official added that the cremation of the bodies of the victims had begun, and that the cable steamer Pouyer Quertier was proceeding to repair the northern cable.

The waves of lava were still reported to be flowing northward. They extended even to Le Carbet.

The Colonial Minister organized a relief distribution committee, consisting of himself and M. Decrais, former Colonial Minister; the Colonial members of the Chamber of Deputies, the

Colonial Senators and a number of commercial men. President Loubet of France has contributed $4000 and the Cabinet donated $1200 to the fund being raised for the sufferers by the St. Pierre disaster. The British Ambassador, Sir Edmund J. Monson, called at the Elysee Palace and communicated to President Loubet, personally, the sympathy of King Edward.

A despatch received in London from the island of Dominica, British West Indies, said that a man who had just returned from the Boiling Lake District of that island went within a hundred yards of the lake, and found that the water had disappeared, and that from a vent ten feet in diameter in the centre was arising a column of steam to a height of thirty feet before spreading into the atmosphere. That district otherwise was apparently unchanged, but the sulphur gases were very strong.

ESCAPING IN BOATS.

Four small boats loaded with refugees from Grand Riviere, Martinique, arrived at Dominica in a pitiable condition. They reported that six other boats left that village at the same time. It was not known what became of them.

Advices received at St. Thomas, Danish West Indies, from the Island of Dominica, said that boats arriving there reported that many persons were drowned while crossing to Dominica from the island of Martinique, where some of the out parishes were inundated. The eruption of Mont Pelée continued. The lava was progressing northward. The whole northern region was now a rock waste, denuded of vegetation.

Reports from the Island of St. Vincent said that up to the afternoon of Friday, May 9th, over two hundred deaths had occurred there owing to the volcanic outbreak in that island. Definite news, however, was lacking. Many estates were destroyed and steam and ashes were belched forth from seven in the morning until 9.30 at night. The eruption was now invisible at Kingston. Huge dust clouds were blown eastward. Great distress prevailed at St. Vincent, where there were many injured persons. It was believed that about five hundred persons had lost their lives at St.

Vincent. This number was greatly increased afterwards. The majority of the corpses were still unburied.

The British Royal Mail steamer Solent went from Barbadoes to Martinique with supplies and doctors. From the Island of Trinidad, the British Royal Mail steamer Kennet went to Fort-de-France. The British second class cruiser Indefatigable was on her way from Trinidad to St. Vincent with stores for the relief of the sufferers there. It was reported here that Fort-de-France (Martinique), was threatened. Great tension prevailed everywhere throughout the West Indies.

WARNING OF THE ERUPTION.

The crater of Mount Pelée had been wearing its "smoke cap" since the 3d of May, but there was nothing until Monday, the 5th, to indicate that there was the slightest danger. On that day a stream of boiling lava burst through the top of the crater and plunged into the valley of the River Blanche overwhelming the Guerin Sugar Works, and killing twenty-three work people and the son of the proprietor. A commission was appointed by the Governor to investigate the outbreak, and it returned a reassuring report on Wednesday evening. But about 8 o'clock on Thursday morning a shower of fire rushed down on St. Pierre and the coast from Le Carbet, which had a population of 6,000, to Le Pecheur, which had a population of 4000, burning everything in its path.

Throughout Thursday the heat in the vicinity of St. Pierre was so intense and the stream of flowing lava was so unremitting that it was impossible to approach the town during the early part of the day. As evening approached, the French cruiser Suchet, after a heroic battle with the heat, suffocation and sulphur fumes, succeeded in making a dash toward the shore, nearing the land close enough to enable her to take off thirty survivors of the disaster, all of whom were horribly burned or mutilated. St. Pierre at that time was an absolute, smoking waste, concealing 25,000 corpses, whose decomposition necessitated, in some cases, instantly completing their cremation, which was only partially

accomplished by the lava. The inhabitants of Fort-de-France were panic stricken, the morning of the disaster, when the sky suddenly blackened and it was as dark as at midnight. The sea shrank back thirty yards, and hot rain began to fall, while gravel, the size of walnuts, poured down on the town. This lasted about fifteen minutes.

The 450 survivors who were brought to Fort-de-France from St. Pierre by the French cable repair ship Pouyer Quertier came from the town of Le Pecheur, where, surrounded on all sides by flowing lava, they were nearly roasted to death, and expected momentarily to be engulfed.

RIVERS OF BURNING LAVA.

The latest reports received showed that lava continued to pour down the slopes of the mountain, slowly engulfing the whole north side of the island, while fresh crevasses were continually opening.

Secretary of the Navy Moody at Washington cabled the commander of the cruiser Cincinnati, at San Domingo City, to proceed to Martinique and give such aid as was possible. The Secretary of the Navy found, after consultation with Assistant Secretary Hill, that it would be safe to take the Cincinnati away from San Domingo. The reason for this belief was the cablegram received from the United States Consul, Maxwell, at San Domingo City:

"The situation in San Domingo is improving. The provisional government has been announced at the seaports, and for the most part in the interior. All executive affairs are under the provisional government, and Vasquez is the provisional President."

It was considered possible that the Potomac already had left San Juan for Martinique, but there was no doubt on this point, because the Navy Department had not yet been able to secure response to an inquiry on this point sent by cable to the commandant of the naval station at San Juan. As a further precautionary measure Secretary Moody sent a telegram to the commandant of the Brooklyn yard:

"Order Dixie to prepare for sea as soon as practicable. Report when she can be made ready."

The Dixie is a ship of considerable carrying capacity, and would be better fitted than any of the regular naval ships to hasten to Martinique with relief supplies, which could be obtained more readily at New York than at any of the West Indian islands. The Secretary was informed that the Dixie could be ready by Tuesday, the 14th.

In anticipation of the passage by the House of the Senate bill making an appropriation for the relief of the sufferers from the eruption which devastated Martinique, the War Department took immediate action for the purchase and transportation of supplies to the distressed islanders. Brigadier-General Weston, Commissary General, was directed to collect stores at New York. They were to be immediately loaded on an army transport, or on the Dixie, a naval training ship, which Secretary Moody was informed would be ready to sail on Tuesday, the 14th. As food was the first need of the people, the Dixie was to be hurried to Martinique. The transport Sedgwick, which was at New York, was to convey clothes, lumber and such other supplies as the information by the State Department showed to be necessary.

QUICKEST METHOD OF RELIEF.

"Of course, the action," it was stated, "is contingent upon the assent of France, but that government will undoubtedly gratefully accept the charity of the United States. M. Cambon, the French Ambassador, states that, as supplies from this country could reach the island more quickly than from France, undoubtedly the people of the French Republic would appreciate any relief this country would afford. At the same time, Secretary Hay will recognize the sovereignty of France by notifying the Paris authorities through Ambassador Porter of the readiness of this Government to extend relief to Martinique.

"France's acceptance being merely a matter of form, the work of shipping supplies will not for a moment be interrupted. Officers of the army and navy will be detailed to supervise the

distribution of relief, and their instructions will be stringent to co-operate in every way with the French authorities. If considered desirable, the supplies will be turned over to the acting Governor General of Martinique. There is not to be the slightest friction between the American and French authorities if it can be avoided under the instructions which will be issued by the War and Navy Departments.

"It was suggested that the transportation of relief might be more expeditiously effected by using San Juan as the base. Governor Hunt could send such supplies from Porto Rico as could be gathered there, and then supplies purchased in this country could follow.

COMMUNICATION INTERRUPTED.

"No word reached the State Department regarding conditions in Martinique or in the island of St. Vincent. Cable communication with St. Vincent, as well as with Martinique, has been interrupted, according to information in possession of the State Department, and this probably accounts for the fact that the United States has not heard from Earnest A. Richards, its Consular agent at that point. Mr. Richards is not a citizen of the United States, but a British subject. He was born at St. Vincent and has always resided in the island. He was appointed Consular agent upon the recommendation of the American Consul in the Barbadoes.

"In view of the distress which exists in St. Vincent, an effort may be made by the State Department to have the bill for the relief of Martinique so amended that it will enable the dispatch of supplies to the British island as well. This will be done in order to prevent any legal technicalities being raised by accounting officers. The Administration is hopeful, in view of the extent of the disaster, and the fact that France and Great Britain cannot promptly send relief from Europe, that the House will act at once upon the relief bill. As soon as passed it will be conveyed to the White House, where it will receive the immediate approval of the President. If it is determined to send supplies to St. Vincent, the Dixie or some other vessel will be ordered to proceed to that island."

That the Island of St. Vincent had fallen a victim to the direful visitation that desolated Martinique was evident from the following despatch sent from Kingston by way of St. Lucia:

After numerous earthquakes during the preceding fortnight, accompanied by subterranean noises in the direction of the Soufriere volcano, in the northwestern part of the island, a loud explosion from the crater occurred, and the water in the crater lake ascended in a stupendous cloud of steam and exploded heavily.

The noises grew louder continually until the old crater, three miles in circumference, and the new crater formed by the last eruption, belched smoke and stones, forcing the residents of Wallibou and Richmond Valley beneath the volcano to flee to Chateau Belair for refuge. The thunderous noises, which were continually increasing, were heard in neigboring islands 200 miles away.

COLUMNS OF STEAMY VAPOR.

At midday the craters ejected enormous columns of steamy vapor, rising majestically eight miles high and expanding into wonderful shapes, resembling enormous cauliflowers, gigantic wheels and beautiful flower forms, all streaked up and down and crosswise with vivid flashes of lightning, awing the beholder and impressing the mind with fear. The mountain labored to rid itself of a mass of molten lava which later flowed over in six streams down the side of the volcano, and the greater noises following united in one continuous roar all evening and through the night, accompanied with black rain, falling dust and favilla scoria, attended with midnight darkness, creating a feeling of fear and anxious suspense.

The next morning there was a fresh eruption and ejections of fiery matter, more dust covering the island, in some places two feet deep. The crater was still active as this despatch was sent, and great loss of life was believed to have occurred.

The lava destroyed several districts, with their live stock. People fled, the streams were dried up, and in many places a food and water famine was threatened. The Government was feeding numbers of sufferers from the outbreak.

Great physical changes have taken place in the neighborhood of the Soufriere. Several districts had not yet been heard from and the scene of the eruption was unapproachable. Every hour brought sadder news. The nurses and doctors were overworked

As a result of the disaster on this island, all business was suspended for three days. The public mind was still unsettled, fearing further disaster. Among the deaths were whole families, whose corpses were, in several places, still lying unburied. The dead were to be interred in trenches.

A special correspondent at Castries, St. Lucia, telegraphed the following on May 11th :

The first relief parties have ventured into the streets of St. Pierre. It was not expected that survivors would be found, and so there has been no disappointment of the mournful reports that have been returned. All of the earlier stories of the disaster worked by Mont Pelée have been verified. The destruction of the city is complete. Not a building remains standing. The desolation baffles description.

HEAPS OF DEAD.

Piles of dead in the vicinity of the site of the Cathedral tell a story of the attempt to find sanctuary and refuge in the great structure of worship. Men and women, panic stricken at the cataclysm, turned in the moment of their despair to the Cathedral and were apparently overcome before they could reach its doors.

So far the search has been hindered by the fires that are still raging, and the investigators are in great danger. Mont Pelée is active but the eruption is subsiding. In St. Pierre every form of life has apparently been destroyed. It will be impossible to penetrate to the centre of the ruins for several days. From the position of the bodies the opinion is formed that many were overcome almost before they realized the extent of the peril. Many of the bodies are in life-like positions, as though death had come with a breath, as indeed may have been the case.

Many of the bodies are so burned as to make identification impossible, but in other cases the opposite is the case. Some

have been identified by the searching parties, which are all under military control and are conducted under orders. Scenes in St. Pierre are heartrending. Steps have been taken to prevent disease from resulting from the disaster. Burial parties are working night and day, but it is impossible that the dead can be cared for as their friends would wish.

Military rule is established in the town to prevent vandals from working. Such property as has not been destroyed will be protected. One of the great misfortunes arises from the fact that the storehouses of provisions have been swept out of existence. Martinique must depend upon the charity of the world to prevent a food famine. Already food is exhausted at Fort-de-France, which has been overrun by refugees from the country.

Appeals have been sent to the neighboring islands for assistance; meantime the few provision stores are under close guard by the soldiers. In the country there is no food, and it is believed that thousands are starving. As soon as food can be obtained relief parties will be sent out from Fort-de-France.

OPINION OF AN EXPERT.

Looking on the St. Pierre disaster as a proof of theories which geologists have long held regarding the chain of islands of which Martinique is a link, Dr. J. Paul Goode, editor of the "Journal of Geography," and an instructor in the University of Pennsylvania, said:

"It is incomprehensible to me that people will persist for generations in taking their lives in their hands by making homes on such an island as Martinique. For decades geologists have held that there is a line of weakness in the earth's crust extending from near Trinidad, and the Highlands of Guiana, around in quarter circle to Porto Rico, then through Cuba, and finally connecting with the volcanoes in Mexico, which have been active within a month past. In Cuba, the line branches off, also, up through Florida, and runs up towards Lake Michigan, through the Eastern Mississippi Valley. It has been shown conclusively that all this section is rising, though that portion within the

United States is so slow in its movement as to be imperceptible, save when we consider long ages of time.

"The Lesser Antilles, of which Martinique is one, are simply the peaks of volcanoes, about half of which are submerged. They differ from the volcano of the Ætna or Kilauea type, in that their discharge consists chiefly of hot cinders. There is usually little or no lava. This means, too, that no warning will be given of an eruption. I cannot understand why people will want to live in such a place.

"Professor Milne's instruments and records on the Isle of Wight have recorded no general disturbance of the region, so it is hardly probable that outbreaks will be general in the region I have described. The eruption shows, however, the weakness of the crust at this point. As with a boiler, the explosion occurred along the line of least resistance, and the crater of Mont Pelée offered the outlet.

"The scientists' imagination would like to foretell for the future a solid mass of land from Trinidad to Cuba, but we cannot tell when a cessation will come of those forces now tending to raise this part of the bottom of the sea."

TWO LINES OF CABLES.

In New York the French Cable Company announced at noon on May 12th, that communication was open with Fort-de-France over two lines, one by the way of Teneriffe and Noronha, the other from the Brazilian coast, through Madeira. Until the above date the French government monopolized both these lines nearly all of the time, but ordinary business was transmitted over both of them soon afterward.

E. A. Outerbridge, of the Quebec Steamship Company, which owned the ill-fated Roraima, said that no additional cablegrams had come through from the company's agents, and he believed that nothing more was known at Dominica of the fate of the company's friends and consignees in St. Pierre. L. W. and P. Armstrong, of No. 106 Wall street, received no answers to their urgent requests to agents in Guadeloupe for news.

Inquiry among local fire insurance agents indicated that American companies sustained no losses. A. M. Thorburn, secretary and assistant manager of the American branch of the Sun Insurance Company, of London, which carried some of the Martinique risks, said that the business at St. Pierre was placed direct from the British office. He did not think any American company did business there. Most of the property, particularly that owned by foreigners and merchants doing a foreign business, is insured in the English and Continental companies, and undoubtedly they would lose heavily.

Mr. Thorburn said that he had not seen the Martinique policies, but that he thought they were modelled after the American policies written for volcanic countries. They make the insurers liable for damage from volcanic eruptions, unless otherwise provided. Tornadoes, lightning, insurrections and civil disorders are causes of loss which are usually not insured against, but the companies are generally liable in case of earthquakes and volcanic eruptions.

LOSSES AT ST. PIERRE.

Thomas A. Buckner, vice-president of the New York Life Insurance Company. said: "We had many policies in effect in St. Pierre, but we cannot estimate our loss until we get a list of the dead. Our business was mostly with foreigners on the island. We had no office there, but obtained business in various ways. Perhaps we shall escape with a loss of $100,000, but that is only mere guesswork now."

William A. Alexander, secretary of the Equitable Life Insurance Company, said: "Without my office records I cannot tell what our St. Pierre losses will be, but I am inclined to think they are not large. We had no agency there, though we may have had agents."

Foulke & Co., of No. 25 Beaver street, had about given up the barkentine L. W. Norton. Nothing had yet been heard from her. None of the officers or crew lived in New York, Captain Alexander Parks lived at Port George, N. S, where he left a wife, four sons and a daughter. He sailed from New York, April

12, and arrived at St. Pierre April 30. The vessel was worth $15,000 and her cargo from $30,000 to $50,000.

The various accounts of the volcanic outbreak in the West Indies which reached London, left only a shadow of hope that the later details would greatly minimize the extent of the catastrophe, and the fear was beginning to seize the British papers that even worse news would come.

For instance, the "Standard," in an editorial, said:

"It is only too clear that the area affected is larger than known at first. If Dominica and St. Lucia have not suffered greatly there is reason to fear that their turn may come, nor is it by any means certain that corresponding convulsions have not occurred or may not soon follow on the mainland of Central and South America. In the presence of such forces man is helpless, and we can only prepare to relieve the survivors as speedily as possible. The United States has set us an honorable example."

PLANS FOR A MASS MEETING.

A New York journal contained the following:

"Plans are now being matured for a meeting in this city of all the members of the colony formed by former residents of Martinique. It is probable that the meeting will be held Tuesday evening, though final arrangements are yet to be made. Henry C. de Medenil, superintendent of West Indian trade for Flint, Eddy & Co., has been requested by other members of the colony to issue the call for the meeting, and to take preliminary charge. It is believed that men of Martinique will come to New York from all cities within a radius of 500 miles.

"It is intended to take such steps as may be possible looking to relief of the survivors of the disaster caused by the explosion of Mt. Pelée, and representatives will probably be sent to Martinique for the purpose of gathering exact information regarding the fate of relatives of those living in the United States.

"Unspeakable anguish has resulted from the inability to obtain news from St. Pierre. Without hope that the number of victims has been overestimated, there is ever the feeling that the

apparently impossible has happened. The suspense has resulted in the prostration of several women whose relatives are believed to have fallen under the rain of fire."

Victor de Messimy, Cashier of the United Agency Company, of this city, and his cousin, Henry de Massias, who is connected with the American Surety Company, were active in arranging for the meeting. They were unceasing in their efforts to obtain from the South news of their friends, but were unsuccessful. They are convinced that it was impossible for any to have escaped from St. Pierre to Morne Rouge. Neither do they understand how St. Pierre could be totally destroyed while Morne Rouge escaped. Made pessimistic by their knowledge of the lay of the land about St. Pierre, they believe that Morne Rouge was overcome by the fate that befell the greater city lying below.

NO HOPE REMAINING.

"All our relatives and friends are or were in St. Pierre," said Mr. de Messimy, "and it is hard to rob ourselves of the only hope that is left to us. Still it is useless to take to ourselves what reason teaches is a delusion. If St. Pierre has been destroyed, as has been described by the despatches, then there remains nothing to hope."

"Morne Rouge must have been overcome by the same blast of flame that shrivelled the main city, lying five miles further away from Mont Pelée. Morne Rogue lies almost under the crater of Pelée, and if the head of the volcano has been blown off destruction must have rained upon the entire country within a radius of fifteen miles.

"Between Morne Rouge and St. Pierre there is a break in the earth's surface, and a valley as well as a rise of ground, but the fire which swept through the air would have first reached the smaller village before passing down to the harbor.

"It has been impossible for us in New York to fully realize the terrible calamity that has befallen us at home. My cousin and I were in Martinique last year. In the islands I left my sisters and many other near relatives.

"Henri left his parents. His father was a prominent architect and a member of the City Council of St. Pierre. Henri has two brothers now in Paris attending school. They will be left for the time being without funds, but, of course, as soon as some idea of the true conditions in Martinique is obtained their affairs can be attended to.

"At first I guess we were all too stunned to act, but now we know the full extent of our loss, and we will do what we can to lessen the effects of the blow. A meeting will be held here in a few days. The call will be issued by Mr. Medenil, who is regarded as the leader of the colony here.

"There are about twenty-five families now in New York who came here from Martinique. All are fairly well to do. Steps will be taken to give such aid to the sufferers in Martinique as we can. We will, too, thank the people of the United States, as well as the Government, for the prompt steps taken to render aid and for the expressions of sympathy which seem to have come from all.

NO MENTION OF DANGER.

"I want to correct the impression that prevails here that warning was given by Mont Pelée of the destruction the volcano was about to work upon St. Pierre. We had letters from our friends, now all dead, which were written as late as April 25. In none of the letters is mention made of the threatened activity of Pelée. The volcano has always been regarded as extinct and harmless. I am sure that our friends would have recognized their danger had Pelée given such warning as I have seen asserted in some of the papers."

Yet all accounts agree that clouds of smoke from Mont Pelée filled the air five days before the catastrophe.

Sir Robert Stawell Ball, LL. D., F. R. S., in "The Earth's Beginning," gives some very interesting facts about volcanic disturbances.

"The internal heat of the earth," he says, "derived from the primæval nebula, is in no way more strikingly illustrated than by the phenomena of volcanoes. We have no reason to believe that

the earth is fluid in its interior. The evidence has proved that, under the extraordinary pressure which prevails in the earth, the materials in the central portions of our globe behave with the characteristics of solids rather than of liquids. But though this applies to the deep seated regions, it need not universally apply at the surface or within a moderate depth from the surface. When the circumstances are such that the pressure is relaxed, then the heat is permitted to exercise its property of transforming the solids into liquids. Masses of matter near the earth's crust are thus, in certain circumstances, and in certain localities, transformed into the fluid or viscid form. In that state they may issue from a volcano and flow in sluggish currents as lava.

CAUSE OF VOLCANIC ACTION.

"There has been much difference of opinion as to the immediate cause of volcanic action, but there can be little doubt that the energy which is manifested in a volcanic eruption has been originally derived in some way from the contraction of primæval nebula."

The author then devotes much space to Krakatoa, in the Straits of Sunda, a volcanic island almost unknown until 1883, when it suddenly sprang into notice.

"Insignificant though it had hitherto seemed," says the author, "the little island was soon to compel by its tones of thunder the whole world to pay it instant attention. It was to become the scene of a volcanic outbreak so appalling that it is destined to be remembered throughout the ages."

There were notable warnings in the early spring, but the people of Batavia, far from being terrified, chartered a steamer and went forth for a pleasant picnic to the island. They beheld a vast column of steam at the summit, which poured forth with terrific noise from a profound opening about thirty yards in width.

"As the summer of this dread year advanced," Sir Robert writes, "the vigor of Krakatoa steadily increased, the noise became more and more vehement; these were presently audible on shores ten miles distant, and then twenty miles distant, and still those

noises waxed louder and louder, until the great thunders of the volcano, now so rapidly developing, astonished the inhabitants that dwelt over an area at least as large as Great Britain. With each successive convulsion a quantity of fine dust was projected aloft into the clouds. The wind could not carry this dust away as rapidly as it was hurled upward by Krakatoa, and accordingly the atmosphere became heavily charged with suspended particles. A pall of darkness thus hung over the adjoining seas and islands. Such was the thickness and the density of these atmospheric volumes of Krakatoa dust that, for one hundred miles around, the darkness of midnight prevailed at midday. Many thousands of the unfortunate inhabitants of the adjacent shores of Sumatra and Java were destined never to behold the sun again. They were presently swept away to destruction in an invasion of the shore by the tremendous waves with which the seas surrounding Krakatoa were agitated."

A TERRIFIC CONVULSION.

The volcano continued in eruption during July and August, and on the twenty-seventh of the latter month the supreme display occurred. After two or three preliminary explosions, there was a frightful convulsion which tore away a large part of the island of Krakatoa, and scattered it to the winds. In that final effort all records of previous explosions on this earth were completely broken. The noise was plainly heard at Batavia, 100 miles away, where houses trembled and windows rattled as if heavy artillery were being discharged. Indeed, the thunders of the great volcano attracted the attention of the coast guard at the island of Rodrigues, 3000 miles to the west.

"Let us say, for example," the author continues, "that an explosion occurred at Pike's Peak as resonant as that from Krakatoa. It would certainly startle not a little the inhabitants of Colorado far and wide. The ears of dwellers in the neighboring States would receive a considerable shock. The sonorous waves would roll over to the Atlantic coast; they would be heard on the shores of the Pacific. Florida would not be too far to the south, nor Alaska too remote to the north."

Evidence of the eruption of Krakatoa were seen in the country and elsewhere, the air waves spreading from the volcano to the antipodes. It also taught lessons on the constitution of our atmosphere. Before the occurrence no one had the slightest suspicion that far up above, twenty miles over our heads, a mighty tempest is incessantly hurrying with a speed much greater than that of the awful hurricane which once devastated so large a part of Calcutta and slew so many of its inhabitants.

All that Krakatoa did was simply to provide the charges of dust by which, for one brief period, this wind was made visible. In the autumn of 1883 the newspapers were full of accounts of strange appearances in the heavens. These came from Ceylon, the West Indies and other tropical places. All had the same tale to tell. All these phenomena were due to Krakatoa. It was in the late autumn of 1883 that the marvellous series of celestial phenomena connected with the great eruption began to be displayed in Great Britain. Then it was that the glory of the ordinary sunsets was enhanced by a splendor which has dwelt in the memory of all those who were permitted to see it. The dust from Krakatoa produced this.

CHAPTER IV.

AWFUL SCENE IN ST. PIERRE.—WHOLE MOUNTAIN APPEARED TO BLOW UP.—SHIPS SWALLOWED BY AN ENORMOUS WAVE.—HARROWING TALES BY EYE-WITNESSES OF THE BURNED CITY.

DETAILED descriptions of the terrible scene at St. Pierre reached Fort-de-France on Monday, May 12th, when the Government relief expedition that was the first to penetrate the ruins of the city sent back messengers asking for more men and supplies. The expedition, which left Fort-de-France on the Government steamer Rubis, made a landing near St. Pierre. After a terrible experience in crossing fields of hot ashes knee deep, the more daring ones in the party succeeded in reaching what had been the streets of the city.

In the party were detachments of French infantry and gendarmes and several priests. The few survivors rescued were at Le Carbet and Case Pilot, suburban villages, to which they had fled. More than a thousand of them had died of starvation and exposure since the destruction of St. Pierre. The heat from the smoking, lava-covered ruins at St. Pierre was suffocating, and the stench from the charred bodies which filled the streets was awful. Only a few walls of buildings were standing. The hospital clock was found in tact, with its hands stopped at 7.50 A. M., the exact hour of the volcano's eruption. The offices of the cable company had disappeared. On all sides were found portions of bodies. They were gathered up by the soldiers and gendarmes and burned in the public squares. Not a drop of water was procurable ashore.

The darkness caused by the clouds of volcanic dust shrouded the town. Continuous subterranean rumblings added to the horror of the scene. The fort and central quarters of the town were razed. The ruins were buried in hot cinders.

The iron grill-work gate of the Government office was the only portion of that once magnificent building standing. Streets

could not be traced. Huge heaps of smoking ashes were to be seen on all sides. At the landing place some burned and ruined walls indicated the spot where the Custom House formerly stood. Traces of the larger shops could be seen. Hundreds of bodies were found lying in all attitudes, showing that the victims had met death as if by a lightning stroke. Every vestige of clothing had been burned away from them. Grim piles of bodies were stacked everywhere, showing that death had stricken them while the crowds were vainly seeking escape from the fiery deluge.

On one spot a group of nine children were found. They were locked in one another's arms. The vaults of the Bank of Martinique, at the head of what had been the Rue de l'Hopital, were found intact. They contained two million francs, or $400,000, in specie and other securities, which was sent there for safekeeping. The vaults of the Government treasury were searched in the hope that a large amount of money and other valuables deposited by the principal merchants of the city might be saved.

THE DEVASTATION COMPLETE.

Many of the parties were overcome by the terrible heat and stench of burned bodies, and the surgeons accompanying them were kept busy. It was reported that there is left no trace whatever of the United States Consulate, which was on the Rue de Torraile. The sea for miles around was covered with the wreckage of vessels, and ashore only a few trees, all bent seaward by the force of the volcanic shower, were left standing.

The Ministry of Marine, at Paris, received a cable from the commander of the warship Suchet, dated Fort-de-France, which said he explored St. Pierre with a squad of marines. The town was a mass of smoking ruins, under which the victims were buried. The commander reported that it was impossible to advance to the north of the island owing to the rain of ashes, which was most intense. The volcano still presented a menacing appearance, and rumblings, accompanied by flashes and the projection of ashes and stones occurred.

The French Cable Company received on May 12th the

following important despatch from its manager at Fort-de-France, Martinique:

"I have sent an agent to St. Pierre. He was able to find the company's offices, buried under a pile of rubbish, but could find no trace of the general manager, M. Jallabert, or the personnel of the office, consisting of five men. The town is strewn with corpses, the cremation of which has begun. The cable ship Pouyer Quertier is now proceeding to repair the cable from Martinique to Hayti and New York."

M. L'Heurre, Secretary of Martinique, cabled the Minister of Colonies that nothing was left of the villages on the north coast and the interior of that part of the island. The despatch also stated that a fresh flow of lava had occurred from the northern crater, covering the land with the aspect of a vast rock. The list of dead was added to by this eruption.

UNPARALLELED HORRORS.

The news which reached Fort-de-France of the relief work at St. Pierre told of the horrors of the scene there. Never since the world began, it is stated, have human eyes witnessed such a gruesome scene. Hundreds of flaring funeral pyres, on which the bodies of dead were thrown, sent up their flames, to mock the still flaring volcano's work of death. It was estimated that twenty thousand bodies of the dead had already been burned.

French soldiers form the cremation parties. They said the work on which they were engaged was the most terrible they had ever known. The bodies, many of which were already charred and scarred by lava burns, were soaked with coal tar and petroleum to make them burn the faster. The funeral pyres were enormous heaps of wood and branches of trees. Upon these the bodies were thrown, and what was left of them was consumed. This was a precautionary measure to prevent the outbreak of disease and contagion.

The thrilling story related by Captain Freeman, of the British steamship Roddam, one of the few survivors, will be read with painful interest.

"The steamer Roddam, of which I am captain, left St. Lucia at midnight of May 7th, and was off St. Pierre, Martinique, at 6 o'clock on the morning of the 8th. I noticed that the volcano, Mont Pelée, was smoking, and crept slowly in toward the bay, finding there among others the steamer Roraima, the telegraph repairing steamer Grappler and four sailing vessels. I went to anchorage between 7 and 8, and had hardly moored when the side of the volcano opened out with a terrible explosion.

"A wall of fire swept over the town and the bay. The Roddam was struck broadside by the burning mass. The shock to the ship was terrible, nearly capsizing her. Hearing the awful report of the explosion and seeing the great wall of flames approaching the steamer, those on deck sought shelter wherever it was possible, jumping into the cabin, the forecastle, and even into the hold.

BURNING EMBERS EVERYWHERE.

"I was in the chart room, but the burning embers were borne by so swift a movement of the air that they were swept in through the door and port holes, suffocating and scorching me badly. I was terribly burned by these embers about the face and hands, but managed to reach the deck. As soon as it was possible, when there, I mustered the few survivors who seemed able to move, ordered them to slip the anchor, leaped for the bridge and rang the engineer for full speed astern. The second and third engineers and a fireman were on watch below, and so escaped injury. They did their part in the attempt to escape, but the men on deck could not work the steering gear because it was jammed by the debris from the volcano.

"We accordingly went ahead and astern until the gear was free, but in this running backward and forward it was two hours after the first shock before we were clear of the bay. One of the most terrifying conditions was that the atmosphere being charged with ashes it was totally dark. The sun was completely obscured and the air was only illuminated from the flames of the volcano and those of the burning town and shipping. It seems small to say that the scene was terrifying in the extreme.

"As we backed out we passed close to the Roraima, which was one mass of flames. The steam was rushing from the engine room, and the screams of those on board were terrible to hear. The cries for help were all in vain, for we could do nothing but save my own ship. When I last saw the Roraima she was settling down by the stern. That was about 10 o'clock in the morning.

"When the Roddam was safely out of the harbor of St. Pierre and its desolation and horrors, I made for St. Lucia. Arriving here, and when the ship was safe, I mustered the survivors as well as I was able and searched for the dead and injured. Some I found in the saloon, where they had vainly sought for safety, but cabins were full of burning embers that had been blown in through the port holes. Through these the fire swept as through funnels and burned the victims where they lay or stood, leaving a circular imprint of scorched and burned flesh. I brought ten on deck who were thus burned. Two of them were dead, the others survived, although in a dreadful state of torture from their burns. Their screams of agony were heartrending.

TONS OF POWDERED LAVA.

"Out of a total of twenty-three on board the Roddam, which includes the captain and the crew, ten are dead and several are in the hospital. My first and second mates, my chief engineer and my supercargo, Campbell by name, were killed. The ship was covered from stem to stern with tons of powdered lava which retained its heat for hours after it had fallen. In many cases it was practically incandescent, and to move about the deck in this burning mass was not only difficult but absolutely perilous.

"I am only now able to begin thoroughly to clear and search the ship for any damage done by this volcanic rain, and to see if there are any corpses in out-of-the-way places. For instance, this morning, I found one body in the peak of the forecastle. The body was horribly burned and the sailor had evidently crept in there in his agony to die. On the arrival of the Roddam at St. Lucia the ship presented an appalling appearance. Dead and calcined bodies lay about the deck, which was also crowded with

injured, helpless and suffering people. Prompt assistance was rendered to the injured by the authorities here, and my poor, tortured men were taken to the hospital.

"The dead were buried, and I had omitted to mention that out of twenty-nine black laborers that I brought from Grenada to help in stevedoring, six only survived. Most of the others threw themselves overboard to escape a dreadful fate, but they met a worse one for it is the actual fact that the water around the ship was literally at boiling heat. The escape of my vessel was miraculous. The woodwork of the cabins and bridge and everything inflammable on deck were constantly igniting, and it was with great difficulty that we few survivors managed to keep the flames down. The ropes, awnings and tarpaulins were completely burned up.

RAPID RUSH OF FLAMES.

"I witnessed the entire destruction of St. Pierre. The flames enveloped the town in every quarter with such rapidity that it was impossible that any person could be saved. As I have said the day was turned suddenly to night, but I could distinguish by the light of the burning town people distractedly running about on the beach. The burning buildings stood out from the surrounding darkness like black shadows. All this time the mountain was roaring and shaking, and in the intervals between these terrifiying sounds I could hear the cries of despair and agony from the thousands who were perishing.

"These cries added to the terror of the scene, but it is impossible to describe its horror or the dreadful sensations it produced. It was like witnessing the end of the world. Let me add that after the first shock was over, the survivors of the crew rendered willing help to navigate the ship to this port Mr. Plissoneau, our agent at Martinique, happening to be on board was saved, and I really believe that he is the only survivor of St. Pierre. As it is he is seriously burned on the hands and face."

The foregoing graphic account was confirmed by Ellery S. Scott, first officer of the Roraima :

"It was about daylight on the morning of May 6th when we

sighted the island. We had run through a thunderstorm ahead for St. Pierre, and at 6 o'clock were at our anchorage off the Place Bertin Landing. When the agent, with lighters and stevedores, came alongside they told us that Pelée had been acting ugly ever since Saturday, and that there had been quite a heavy fall of hot sand or dust over St. Pierre itself. However, the volcano seemed to have quieted down, and we got the stevedores to work smartly.

"There were about eighteen other steamers and coasting craft anchored as we were in the open harbor, one of them being the Tamaya, a bark from the French port Nantes, her captain being called Moritz or Maurice. Then there were four other large sailing vessels. The British steamer Roddam put into the berth next to ours and let drop her anchor.

"Then something happened. There was a shaking in the air, so that I felt as though some one had jostled me. I was looking at Pelée, and every soul on board looked, too. I can't describe what I saw, of course, but my first thought was that the end of the world would look just like that. It was just as though the mountain had been blown up by all the dynamite in the world.

ROARING DOWN FROM THE SKY.

"First of all a great pillar of flame rushed straight up in the air, then it opened out wider than the mountain itself and came roaring down out of the sky upon us. Some of us, with Morley (second officer) rushed to the forecastle head to heave the anchor. I saw the captain shouting orders, and I saw McTear, the engineer, drop below. As we reached the ship's head the fiery cloud was upon us. Red-hot stones, scalding mud and real splashes of flame dropped and clattered all over the ship.

"There was another roar, and with it all the water in the harbor seemed to gather up and rush among the shipping. Every craft heeled over to the great tidal wave and seemed to careen and sink. When the wave struck us it flooded us fore and aft, sweeping away the masts, funnel, all the boats save one and all the raffle of the deck. There was a ventilator at hand, and to save myself I seized it and was nearly killed thereby, being driven into

it by the force of the wave. A couple of stevedores pulled me out of the ventilator and dragged me into the steerage. There I remained, half dead, for quite a time, during which the ship rolled and the fire and rocks battered the decks.

"Now and then a charred and shrieking sailor rolled down the hatchway and died as he came, so that quite a pile of corpses lay over me. Some one pulled me from under these and I clambered to the deck, and began turning a hand toward saving the injured who were lying all about, though even then small, red-hot stones and mud were falling.

"As I was about this work Captain Muggah came along. I knew him by his clothes, though these were smoldering, but his face was scorched beyond recognition.

"'Lower the boat,' he said.

BOAT BURNED FULL OF HOLES.

"I could not obey his orders, however, for the boat that was left by the tidal wave was burned full of holes by the flaming rain. I saw no more of the captain after that, but I was told by a stevedore of St. Kitts that he jumped overboard and got on a raft that had been hurriedly put together and that he died there. All this time the sea was rolling like the heaviest kind of ground swell, Pelée was roaring, and the air was full of strange shocks.

"When I looked at St. Pierre the sight was terrifying. The town was gone and in its place was a long stretch of gray, smoking, flaming dust. All about us the ships were sunk or aflame and between us and them and the shore dead bodies floated singly and in groups. Some hours after, I didn't know how long it was then, but I've since been told it was at 3 o'clock in the afternoon, the French cruiser Suchet steamed in and rescued seventeen of us more dead than alive. We were carried to Fort-de-France and put in the hospital."

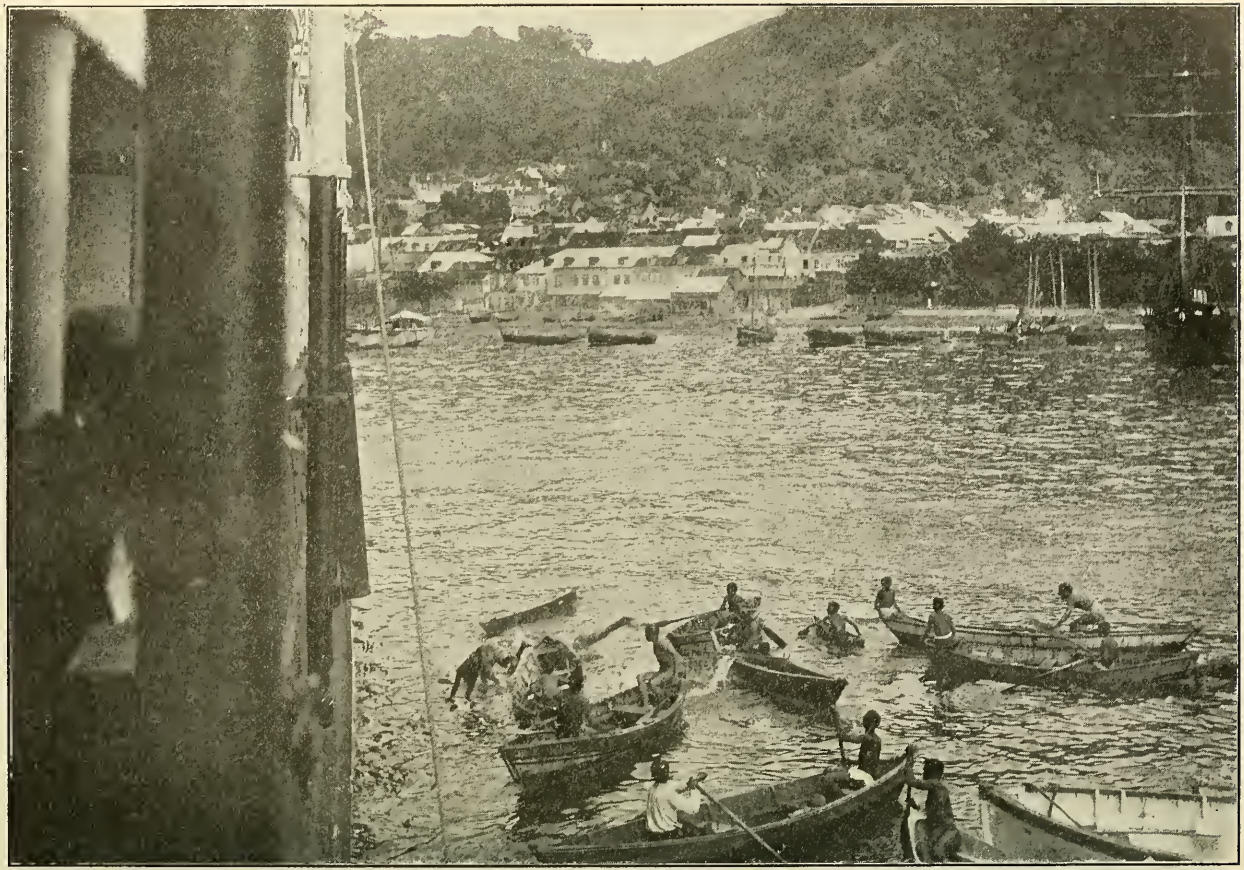
Further particulars of the dreadful catastrophe came on May 12th from Fort-de-France:

"A landing has at last been made in the city of St. Pierre, and the work of exploring the ruins of the annihilated town has

COFFEE TREE, SCENE IN MARTINIQUE

CUTTING SUGAR CANE—SCENE IN MARTINIQUE

COOLIE HUTS, ISLAND OF MARTINIQUE

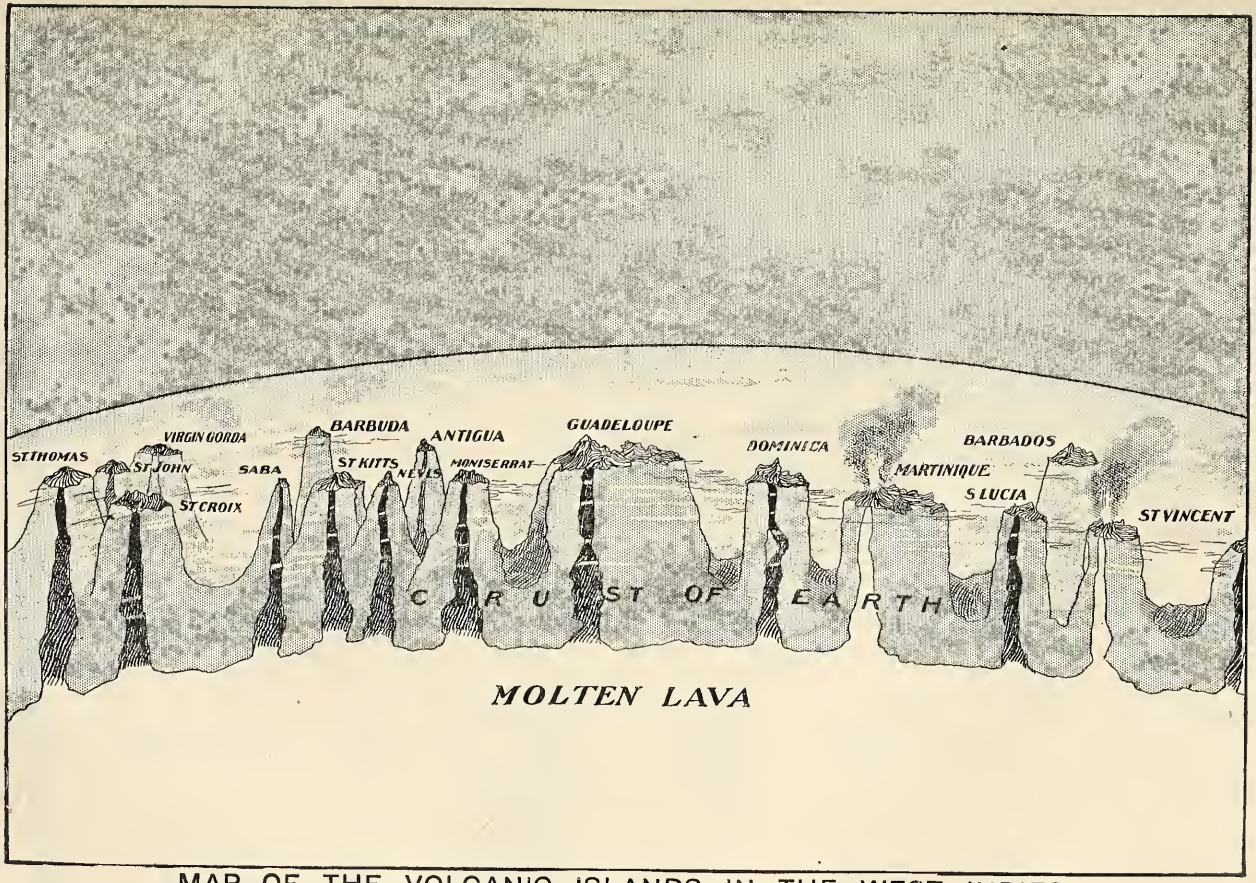


BOYS DIVING FOR COINS IN THE HARBOR OF ST. PIERRE, MARTINIQUE

STATUE OF THE EMPRESS JOSEPHINE, FORT DE FRANCE, MARTINIQUE

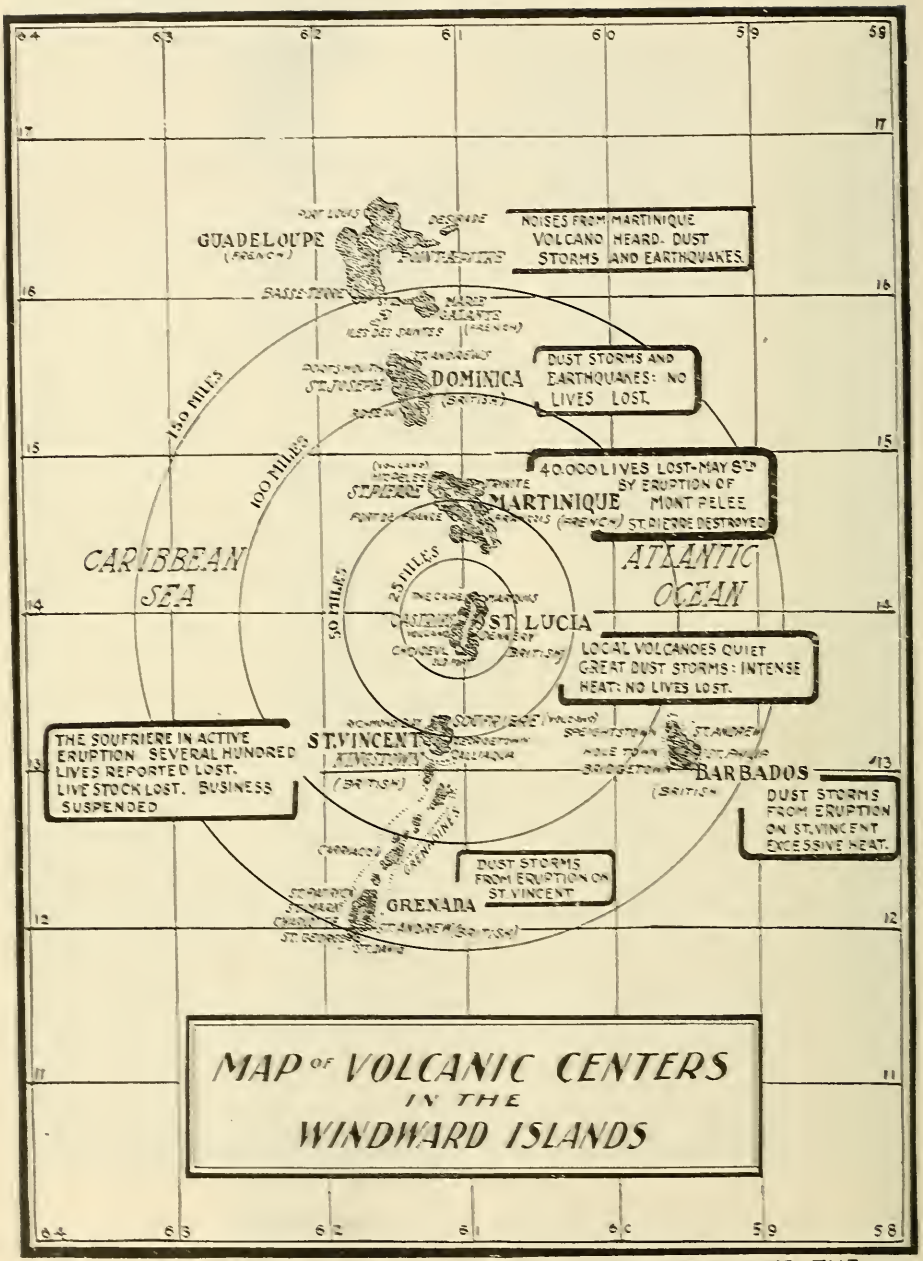
COPYRIGHT, BY J. M. JORDAN, 1898

STATUE OF THE EMPRESS JOSEPHINE,
FORT DE FRANCE, MARTINIQUE



MAP OF THE VOLCANIC ISLANDS IN THE WEST INDIES

WHEN THE MOLTEN LAVA COMES IN CONTACT WITH WATER THE RESULTING STEAM CAUSES EARTHQUAKES AND UPHEAVALS OR VOLCANIC ERUPTIONS



ST. LUCIA BEING IN THE CENTRE—THIS DIAGRAM SHOWS THE DISTANCES BETWEEN THE ISLANDS. THE VOLCANO IN MARTINIQUE IS 100 MILES FROM ST. VINCENT

begun. Enough has already been revealed to indicate that the very worst anticipations as to the result of the eruption of Mont Pelée are realized. Those who have come back here from St. Pierre report that the streets, and all the neighborhood around, what a few days ago was the largest and most prosperous city in Martinique, are now covered with heaps upon heaps of dead bodies in all directions.

"All the dead thus far seen were stark naked, their clothing apparently having burned from their bodies like so much tinder, while they themselves were burned to death. In the vast majority of instances fire seems to have been the sole cause of death. Great numbers of the bodies have been burst asunder by the terrific heat and lie disembowelled.

FACES OF THE VICTIMS.

"In many instances the faces of the victims are quite calm, as though they were stricken down instantly where they stood without a moment's warning or with hardly time to appreciate the deadly peril they were in. Others have stamped on their faces an expression of indescribable terror. The entire city and the neighborhood all about it reek with a horrible odor of burned flesh.

"Almost the first thing done was to make preparations for the cremation of the dead. Fatigue parties of soldiers built enormous pyres of wood and branches of trees, upon which they heaped the dead bodies by scores and burned them as rapidly as possible. To faciliate the combustion and to destroy as far as possible the awful odor of burning flesh which came from them the impromptu crematories were heavily soaked with coal tar and petroleum.

"The total number of dead is now estimated at fully 30,000. The disaster itself took place within thirty seconds, and in that half minute the vast majority of all these people were killed. It is supposed—for there is nobody living apparently to tell the exact facts—that there was suddenly shot down from the mountain a great sheet of flame, accompanied by a terrible gaseous whirlwind and flashes of lightning, precisely such as are now reported as

playing about the summit of La Soufriere on the island of St. Vincent.

"The latest information received here is that the entire quarters of the Fort and of Carbet (districts of the city) are completely wrecked, forming heap upon heap of ruins, covered thickly over with ashes, cinders and masses of mud and lava commingled. What horrible revelations of the havoc wrought to human life which these grim mounds are yet to reveal can hardly be imagined. In these two quarters of the city not a trace of the streets that existed there can be seen. They are buried as completely out of sight as were those of Pompeii.

"Along the water front there are a few walls standing and the ruins of the Custom House can be seen. Curiously enough the face and hands of the clock on the hospital were not destroyed, and they furnish an important record in the history of this terrible catastrophe. The hands of the clock had stopped at precisely ten minutes to eight, showing that it was at that moment that the city was overwhelmed and all those thousands of persons within its environs were destroyed. At the last accounts from St Pierre the work of exploring the ruins for the treasure buried beneath them was going on at the same time with the incineration of the dead."

PRESIDENT ROOSEVELT'S SPECIAL MESSAGE.

President Roosevelt on May 12th sent a special message to Congress rehearsing the facts of the calamity at Martinique, and urging the necessity of prompt relief measures by the United States. He recommended an appropriation of $500,000.

The House passed by an overwhelming vote a bill granting $200,000 for the relief of the sufferers in the West Indies. The bill was a substitute for the relief measure passed by the Senate, and followed the receipt of the message from the President. Mr. Hemenway, the acting Chairman of the Appropriation Committee, explained that the amount was limited to $200,000 owing to the fact that large private contributions were being made. The discussion was brief, Mr. Underwood, of Alabama, being the only one to speak in opposition. The bill was passed by 196 votes to 9.

The Senate subsequently concurred in the action of the House, and the bill was sent to the President.

The War Department took prompt measures to expend the $200,000 relief appropriation through the Commissary Depot in New York. It is hoped to have the Dixie loaded with these supplies by Wednesday, the 14th. Consul Ayme, of Pointe-a-Pitre, cabled from Fort-de-France quoting the Governor as estimating that 30,000 had perished and 50,000 were homeless and hungry in Martinique. Previous despatches had assumed that Governor Mouttet was among the dead.

An expedition sent from Fort-de-France to begin sanitary and relief work at St. Pierre reported that of the refugees who assembled at Le Carbet and Case Pilote, over 1000 had died since the 8th inst. It was also said that 4000 people from Le Precheur and vicinity were rescued by the French cruiser Suchet and the cable steamer Pouyer Quertier and taken to Fort-de-France.

STORM OF POISONOUS GASES.

An examination of the bodies at St. Pierre indicated that the fiery storm which burst over the town from Mont Pelée must have been composed in part of poisonous gases. Nearly all the victims had their hands over their mouths, or were in some attitude showing attempts to escape suffocation. All the bodies were carbonized or roasted. The latest reprts from the northern portion of Martinique were to the effect that the land was in a state of perpetual change. New crevasses and valleys were forming, and lava continued to stream down the sides of Mont Pelée.

The Soufriere volcano in St. Vincent was still in active eruption, according to last accounts. Barbados, ninety-six miles off, was in total darkness for a time, and pebbles and ashes fell there. Refugees from St. Vincent were arriving at Dominica. The French cable steamer Pouyer Quertier in trying to repair the Martinique cable was reported to have found the cable sunk in 600 fathoms of water, where formerly it was only 150 fathoms below the surface.

A public official at Fort-de-France who was fully informed of

the horrible situation in Martinique made the following horrifying statement:

"It now seems to be generally admitted that about 30,000 persons lost their lives as a result of the outbreak of the Mont Pelée volcano, at St. Pierre, on Thursday last. Careful investigation by competent Government officials shows that the earlier reports of the Associated Press were accurate.

"Briefly put, last Thursday morning the city of St. Pierre disappeared within ten minutes in a whirling fire vomited from Mont Pelée, 30,000 persons were instantly and horribly killed and the volcano, whose ancient crater for more than fifty years had been occupied by a quiet lake in which picnic parties bathed suddenly discharged a torrent of fiery mud, which rolled towards the sea, engulfing everything before it. Then the last of cable communication was broken, and the doomed city was isolated from the world.

ACCOUNT BY THE AMERICAN CONSUL.

"The American Consul at Guadeloupe, Louis H. Ayme, has reached the desolate spot where St. Pierre stood and confirms the awful story in all its essential details. From an interview with Consul Ayme, who is a trained American newspaper man, a correspondent of the Associated Press learned the following facts:

"Thursday morning the inhabitants of the city awoke to find heavy clouds shrouding the Mont Pelée crater. All day Wednesday horrid detonations had been heard. These were echoed from St. Thomas on the north to Barbados on the south. The cannonading ceased on Wednesday night, and fine ashes fell like rain on St. Pierre. The inhabitants were alarmed, but Governor Mouttet, who had arrived at St. Pierre the evening before, did everything possible to allay the panic.

"The British steamer Roraima reached St. Pierre on Thursday with ten passengers, among whom were Mrs. Stokes and her three children, and Mrs. H. J. Ince. They were watching the rain of ashes, when, with a frightful roar and terrific electric discharges, a cyclone of fire, mud and steam swept down from the crater over the town and bay, sweeping all before it and destroy-

ing the fleet of vessels at anchor off the shore. There the accounts of the catastrophe so far obtainable cease. Thirty thousand corpses are strewn about, buried in the ruins of St. Pierre, or else floating, gnawed by sharks, in the surrounding seas. Twenty-eight charred, half-dead human beings were brought here. Sixteen of them are already dead, and only four of the whole number are expected to recover.

"The Associated Press steamer, chartered in Guadeloupe, neared Martinique at 6.30 Sunday morning. The island, with its lofty hills, was hidden behind a huge veil of violet or leaden colored haze. Enormous quantities of the wreckage of large and small ships and houses strewed the surface of the sea. Huge trees and too often bodies, with flocks of sea-gulls soaring above and hideous sharks fighting about them, were floating here and there. From behind the volcanic veil came blasts of hot wind, mingled with others icy cold.

MEN AND WOMEN FRANTIC TO ESCAPE.

"At Le Precheur, five miles north of St. Pierre, canoes, with men and women frantic to get away, begged for a passage on the steamer. The whole north end of the island was covered with a silver gray coating of ashes resembling dirty snow. Furious blasts of fire, ashes and mud swept over the steamer, but, finally, St. Pierre was reached.

"The city of St. Pierre stretched nearly two miles along the water front and half a mile back to a cliff at the base of the volcano. The houses of the richer French families were built of stone. The still smoking volcano towered above the ash-covered hills. The ruins were burning in many places, and frightful odors of burned flesh filled the air.

"With great difficulty a landing was effected. Not one house was left intact. Viscid heaps of mud, of brighter ashes or piles of volcanic stones were seen on every side. The streets could hardly be traced. Here and there amid the ruins were heaps of corpses. Almost all the faces were downward. In one corner twenty-two bodies of men, women and children were

mingled in one awful mass, arms and legs protruding as the hapless beings fell in the last struggles of death's agony.

"Through the middle of the old Place Bertin ran a tiny stream, the remains of the River Gayave. Great trees, with roots upward and scorched by fire, were strewn in every direction. Huge blocks and still hot stones were scattered about. From under one large stone the arm of a white woman protruded. Most notable was the utter silence and the awful, overpowering stench from the thousands of dead.

"Careful inspection showed that the fiery stream which so completely destroyed St. Pierre must have been composed of poisonous gases, which instantly suffocated every one who inhaled them, and of other gases burning furiously, for nearly all the victims had their hands covering their mouths or were in some other attitude showing that they had sought relief from suffocation. All the bodies were carbonized or roasted.

A GHASTLY SCENE OF DEATH.

"A. G. Austen, the manager of the Colonial Bank of Barbados, landed at St. Pierre with a party from the British royal mail steamer Solent. A horse and buggy and a policeman were in a dead group at the door of the bank. At the request of S. A. McAllister, the United States Consul at Barbados, Captain Davis and the Solent were placed at his disposition by the Barbados Government. The Solent arrived at about the same time as the Associated Press steamers and brought to St. Pierre the Colonial Secretary, two civil doctors, two military officers, and Dr. W. E. Aughinbaugh, of Washington, as well as a corporal and four hospital orderlies, three trained nures and a full field hospital outfit. The Barbados Government also sent 700 barrels of provisions, one ton of ice and a full supply of medicine. These were useful, but the dead only needed quick burial.

"The Soufriere volcano on the island of St. Vincent has been in full eruption since Wednesday last. Several plantations have been destroyed. Earthquakes and loud reports accompanied the eruption, and stones and ashes fell at Kingstown. Many persons

were wounded, and the bodies of 500 dead are unburied. Barbados, ninety-six miles off, was in total darkness for a time. Pebbles and gritty substances have fallen there. Canoes crowded with refugees are arriving at Dominica, and their occupants are most hospitably received."

Several steamers, including the Government vessel Rubis, started from Fort-de-France May 11th for St. Pierre. They had on board a Government delegate, a number of gendarmes, a detachment of regular infantry and several priests. The vessels also carried a quantity of firewood, petroleum and quicklime, for use in the cremation of the bodies of the victims of the terrible volcanic outbreak of Thursday last. Large quantities of disinfectants and stocks of clothing for the refugees were also shipped to St. Pierre. The refugees had, as a rule, assembled at Le Carbet and Case Pilote, not far from St. Pierre, and it was reported over a thousand of them had died since the fearful stream of lava poured down Mont Pelée. The sea for miles around was covered with the wreckage of the vessels sunk off St. Pierre at the time of the disaster, and in shore only a few trees, all bent seaward by the force of the volcanic shower, were left standing.

SUFFOCATING HEAT.

When nearing St. Pierre the Rubis met a number of tugs towing lighters filled with refugees.

The heat from the smoking, lava-covered ruins at St. Pierre were suffocating, and the stench from the corpse strewn streets was awful. Only a few walls were standing. The report that the hospital clock was found intact, with its hands stopped at 7.50, was confirmed, as was the statement that the offices of the cable company had entirely disappeared.

On all sides were found portions of corpses, which were gathered up by the soldiers and gendarmes and burned on one of the public squares. Not a drop of water was procurable ashore. The darkness caused by the clouds of volcanic dust shrouded the town, and continuous subterranean rumblings added to the horror of the scene.

The fort and central quarters of the town were razed to the ground and were displaced by beds of hot cinders. The iron grill-work gate of the Government offices was alone standing. There was no trace of the streets.

At the landing place some burned and ruined walls indicated the spot where the Custom House formerly stood, and traces of the larger shops could be seen. In that neighborhood hundreds of corpses were found lying in all kinds of attitudes, showing that the victims had met death as if by a lightning stroke. Every vestige of clothing was burned away from the charred bodies, and in many cases the abdomens had been burst open by the intense heat. Curiously enough, the features of the dead were generally calm and reposeful, though in some cases terrible fright and agony were depicted. Grim piles of bodies were stacked everywhere, showing that death had stricken them while the crowds were vainly seeking escape from the fiery deluge.

THOUSANDS OF PEOPLE FLEEING.

Nearly four thousand of the refugees from the vicinity of the village of Le Precheur, a suburban village to the north of St. Pierre, were rescued by the French cruiser Suchet and the cable repair ship Pouyer Quertier, and were brought here.

As a result of his inspection, the commander of the Suchet reported that crevices and valleys were constantly forming in the northern portions of the island, where the land is in a state of perpetual change. Fortunately that part of the country had been evacuated in good time by the inhabitants, who fled to Fort-de-France. Lava continued to stream down the mountain side, accompanied by terrific thunder and lightning.

The dearth of provision was beginning to be felt throughout the island. Numerous families were completely ruined and even shelterless, while the means at the disposal of the authorities were much too inadequate to cope with the situation. Communications were practically cut off from all the surrounding islands, except by stray vessels, which were seized upon by the inhabitants to flee from Martinique.

The stories of the survivors added to the awful details of the particularly harrowing account of the British steamer Roraima.

C. C. Evans, of Montreal, and John G. Morris, of New York, who were at the military hospital of Fort-de-France, said the vessel arrived at six. As eight bells was struck a frightful explosion was heard up in the mountains. A cloud of fire, toppling and roaring, swept with lightning speed down the mountain side and over the town and bay. The Roraima was nearly sunk, and caught fire at once.

"I never can forget the horrid, fiery, choking whirlwind which enveloped me," said Mr. Evans. "Mr. Morris and I rushed below. We are not very badly burned—not so bad as most of them. When the fire came we were going to our posts to weigh anchor and get out. When we came up we found the ship all afire aft, and fought it forward until three o'clock, when the Suchet came to our rescue. We were then building a raft."

STORY OF THE SHIP CARPENTER.

"Ben" Benson, the carpenter of the Roraima, said: "I was on deck, amidships, when I heard an explosion. The captain ordered me to up anchor. I got to the windlass, but when the fire came I went into the forecastle and got my 'duds.' When I came out I talked with Captain Muggah and Mr. Scott, the first officer and others. They had been on the bridge. The captain was horribly burned. He had inhaled flames and wanted to jump into the sea. I tried to make him take a life preserver. The captain, who was undressed, jumped overboard and hung on to a line for awhile. Then he disappeared." "Gus" Linder, the quartermaster of the steamer, who was horribly burned and could scarcely speak, confirmed this.

Joseph Beckels, a seaman, who is fifty years of age and was so frightfully burned that he died, having inhaled flame, said in weak tones that he was the last man to see the captain. The captain was then trying to reach a floating mattress.

From the Italian ship Teresa Lovico several men were saved, but they were in a frightful state, except Jean Louis Prudent, of

St. Pierre. Although on deck and unprotected, he was little burned. Prudent says there was first an awful noise of explosion, and then at once a cyclone of smoke and fire, but such was the awful, poisonous, choking nature of the smoke that it burned worse than fire. When it struck people they fell dead. The cyclone of gas tore the masts out of the ships, blew others up and sunk some of them. Soon afterward came a wave of fire bigger than the smoke cloud.

CHAPTER V.

PRESIDENT ROOSEVELT'S SPECIAL MESSAGE TO CONGRESS.—LARGE APPROPRIATION BY OUR GOVERNMENT FOR IMMEDIATE RELIEF OF THE SURVIVORS.—ADDITIONAL DETAILS OF THE TERRIBLE CALAMITY.—SCENES BAFFLING DESCRIPTION.

ON Monday, May 12th, the President sent the following message to Congress, which was read in the Senate and referred to the Committee on Foreign Relations:

To the Senate and House of Representatives:

One of the greatest calamities in history has fallen upon our neighboring Island of Martinique. The Consul of the United States at Guadeloupe has telegraphed from Fort-de-France, under date of yesterday, that the disaster is complete, that the city of St. Pierre has ceased to exist and that the American Consul and his family have perished. He is informed that 30,000 people have lost their lives and 50,000 are homeless and hungry, that there is urgent need of all kinds of provisions and that the visit of vessels for the work of supply and rescue is imperatively required.

The Government of France, while expressing their thanks for the marks of sympathy which have reached them from America, informs us that Fort-de-France and the entire Island of Martinique are still threatened. They therefore request that, for the purpose of rescuing the people who are in such deadly peril and threatened with starvation, the Government of the United States may send, as soon as possible, the means of transporting them from the stricken island. The Island of St. Vincent, and perhaps others in that region, are also seriously menaced by the calamity which has taken so appalling a form in Martinique.

I have directed the Departments of Treasury, of War and of the Navy to take such measures for the relief of these stricken people as lies within the executive discretion, and I earnestly

commend this case of unexampled disaster to the generous consideration of the Congress. For this purpose I recommend that an appropriation of $500,000 be made, to be immediately available.

THEODORE ROOSEVELT.

White House, Washington, May 12, 1902.

This urgent message brought the volcanic calamity in the West Indies before the House during the afternoon, the District of Columbia measures being laid aside to permit the relief bill to be considered. In view of the President's message urging an appropriation of $500,000, the House Committee on Appropriations unanimously offered a substitute to the Senate bill, making the sum $200,000, and placing its disposition under the President of the United States.

CONSENT FOR IMMEDIATE CONSIDERATION.

Mr. Hemenway, the acting Chairman of the Appropriation Committee, secured unanimous consent for immediate consideration. The amount, he said, had been limited to $200,000 because the Committee was informed that large contributions were being made by private parties. He specified one of $500 made by a citizen of Maine. Mr. Hemenway urged the need of prompt action, saying thousands might die through delay. The text of the substitute as presented was as follows:

"To enable the President of the United States to procure and distribute among the suffering and destitute people of the islands of the French West Indies such provisions, clothing, medicines and other necessary articles, and to take such other steps as he shall deem advisable for the purpose of rescuing and succoring the people who are in peril and threatened with starvation, the sum of $200,000 is hereby appropriated

"In the execution of this act the President is requested to ask and obtain the approval of the French Government, and he is hereby authorized to employ any vessels of the United States Navy and to charter and employ any other suitable steamships or vessels."

Mr. Underwood, of Alabama, said that he was opposed to the

measure and would vote against it. Mr. McRae, of Arkansas, made an appeal for prompt and unanimous action, in the interest of humanity, and Mr. Livingstone, of Georgia, added the hope that the country would not turn back upon its record for succoring those in distress, without reference to nationality or locality.

Mr. Fitzgerald, of New York, sought to have the amount amended to $500,000, in accordance with the President's recommendation, but, in view of the unanimous action of the committee, the amendment was not pressed. The bill was passed—196 to 9. The Senate subsequently concurred in the House amendment, fixing the appropriation at $200,000, and the bill was sent to the President.

VIGOROUS MEASURES FOR PROMPT DESPATCH.

As the action of Congress was anticipated the War Department took vigorous measures to secure the prompt despatch of a relief ship. The profound impression made upon the people of the United States by the terrible calamity was manifested by the action of the President in sending a special message to Congress, and the prompt response of that body by the passage of a joint resolution appropriating $200,000 for the relief of the stricken people. In anticipation of affirmative action by Congress, the President caused the Secretaries of the Treasury, War and Navy to make preparations for the prompt despatch of supplies and vessels to Martinique.

Becoming convinced that the required appropriation would be made, and that the Executive would be given authority to act in the matter of furnishing speedy relief, President Roosevelt summoned Secretary Hay for consultation early in the morning. Mr. Hay brought with him to the White House a despatch received from Consul Louis H. Ayme, of Guadeloupe, who was directed by Mr. Hay to proceed at once to Martinique and report the extensive character of the disaster. The despatch from Consul Ayme served as official confirmation of the newspaper reports as to the extent of the calamity, and in the opinion of the President and Secretary Hay fully justified emergency measures.

Secretary Hay was requested to acquaint Secretary Root and Secretary Moody with the President's wishes, and they were charged to carry out the details of the arrangements. The Treasury Department was also instructed to co-operate, and it was supposed that this would mean the employment of the revenue cutters and the medical officers of the marine hospital service.

The first step was to make preparation for the distribution of the fund which it was confidently felt Congress would appropriate. It was realized that the War Department, with its thoroughly organized divisions for the handling and distribution of supplies of all kinds, was in better condition to take charge of the important work than any other department. The War Department could provide the supplies, but had no means available for their transportation to the West Indeas, and, therefore, it was recognized that merchant lines must be utilized, unless vessels could be furnished by the navy.

ORDERS TO LOAD A VESSEL.

Fortunately, it was found the navy had a vessel, the Dixie, that could be used for the required service. Therefore, it was decided to use that vessel, and orders were immediately telegraphed her commander at New York to prepare to take on army supplies and to sail immediately upon doing so for Martinique. The United States steamship Buffalo, also at New York, was ordered to carry supplies if the Dixie should not be able to take all that might be sent. The Buffalo is a converted freight ship, and well adapted to the work contemplated.

The officers of the Navigation Bureau believed the Dixie could be made ready for sea by Wednesday, the 14th. There were at New York large quantities of army stores, and these could be drawn upon. The scientific divisions of the navy would send on the Dixie, as passengers, two experts with instructions to report on the causes of the calamity, and to gather facts in connection with the results that followed. A specialist on volcanic action from Harvard University was also to go on the Dixie as a passenger.

Quartermaster General Ludington, Commissary General

Weston and Surgeon General Sternberg were summoned to the office of Secretary Root, and after a short consultation were directed to take charge of arrangements for that portion of the work of relief that would come to the War Department. Following this consultation an order was issued from the Adjutant General's office, which, after reciting the anticipated action of Congress in making an appropriation, directed that the Quartermaster, Commissary and Surgeon Generals provide the provisions, clothing, medicines and other necessary supplies to be taken from the stores of the army, in whole or in part. These officials were further directed to make all necessary preparation to accomplish the work assigned to them without delay.

PLANS FOR DISTRIBUTION.

The scheme of distribution decided upon was as follows: Three medical officers, with $5000 in medical stores; one subsistence officer, with $70,000 in stores, consisting of rice, dried fish, sugar, coffee, tea, canned soups, condensed cream, salt, pepper and vinegar; one officer of Quartermaster's Department, with $20,000 in clothing supplies for men, women and children. The above distribution was approved by Secretary Root, who directed that the purchases be made accordingly, ready for shipment.

All the officers mentioned and the stores were to be sent on the United States ship Dixie, to be distributed at such points as might be designated by the navy officer in command of the Dixie, under instructions given by the Secretary of the Navy. The medical officers were instructed to render such medical aid as might be in their power, in addition to the distribution of medical supplies.

With his usual energy and dash, Commissary General Weston telegraphed immediately to Colonel Brainard, the commissary officer in charge at New York, directing him to expend the allotment in the purchase of tea, coffee, sugar and canned soups, and to see that these goods were loaded on the Dixie at once.

Captain Gallagher, one of General Weston's most valued assistants, was selected to go to New York and proceed on the

Dixie to Martinique. He was to have complete charge of the distribution of the stores, and a fund of $5000 was alloted to him for emergency expenses.

There was an air of bustle and hurry about the Cob Dock, in the Navy Yard, Brooklyn, May 12th, due to the rush orders to get the training ship Dixie ready to go to Martinique with relief supplies for the victims of the volcanic eruption. Early in the morning the Dixie's moorings were loosened and two laden coal barges were floated in between her and the dock. Two more were moored on the channel side of the vessel and soon tons and tons of coal were being passed aboard in baskets and dumped into the bunker. The crew of the Dixie, made up of about two hundred men, were early at work, and to their assistance came about two hundred more tars from the receiving ship Columbia.

EMINENT GEOLOGISTS SAILED ON THE DIXIE.

Prof. Thomas A. Jagger, of Harvard University; Prof. Israel C. Russell, of the University of Michigan; Robert T. Hill, of the U. S. Geological Survey; E. O. Hovey, of the American Museum of Natural History, and J. Martin Miller, the well-known historian.

LARGE CARGO OF PROVISIONS.

Carloads of provisions and food supplies of almost all kinds were wheeled from the department of provisions and clothing through the yard to the Cob Dock, to be stored on the training ship. Rations to last the officers and crew three months were put aboard. Besides the rations for the crew the Commissary Department of the army started to send a large stock of supplies aboard. The army sent between 2,000 and 3,000 tons of supplies of all kinds.

Major von Schrader, who has charge at the Army Building in the absence of Colonel Kimball, received from Colonel Brainard, of the Army Subsistence Department, an order to purchase $70,000 worth of tea, coffee, sugar, and canned soups and clothing for shipment to Martinique. Colonel H. J. Gallagher was to go to Fort-de-France and have personal charge of the distribution of

the relief supplies. Twenty thousand dollars were used to provide clothing and temporary shelter for the sufferers, $5000 for medicines and $5000 was allowed to Colonel Gallagher to defray his personal expenses and to be used at his discretion for the relief of the sufferers.

Most of the stores needed for the Dixie were not in stock at the Army Building and Major von Schrader and his staff were busy all day buying them. They purchased cotton prints, hats, shoes, blankets, and wearing apparel, generally for women and children. These were supplemented by large quantities of food in bulk, such as beef, ham, pork, canned goods and vegetables. They also collected large quantities of medical supplies.

Everything purchased was being paid for in cash, and Major von Schrader will be reimbursed out of the appropriation of the Government. Pier 15, Brooklyn, was leased by Major von Scharder as a depository.

APPEAL FROM THE MAYOR OF NEW YORK.

Mayor Low, of New York, issued this appeal for funds for the relief of the sufferers from the disaster at Martinique:

"The appalling calamity at Martinique and in the neighboring islands, makes an appeal to the generosity of New York that I am sure will not be disregarded. It is evident that help will be needed on a large scale, and needed promptly. I am glad to perceive that the Chamber of Commerce is to hold a special meeting on Wednesday to take steps for raising a suitable relief fund. If there are any who wish to transmit money for this purpose through the Mayor, I shall be glad to receive it and to transmit it to its destination through the Chamber of Commerce. I hope that New York will maintain its old time reputation for liberal giving."

After consulting with several other members, Morris K. Jesup, President of the New York Chamber of Commerce, decided not to wait for the special meeting called, but to arrange at once to send relief to the stricken inhabitants of Martinique. He consulted with the French Consul, and, through that official, cabled

on his own responsibility, an offer of 25,000 francs for immediate use by the government of Martinique.

Mr. Jesup also started an investigation among the steamship agencies, which resulted in the discovery that two Quebec Steamship Company boats loaded with provisions were at the Windward Islands, consigned to points not far from St. Pierre. Mr. Jesup hoped to buy the cargoes of one or both of these steamers.

"Doubtless, the Chamber of Commerce will ratify any action I may take," Mr. Jesup said, "and there is no time to wait until we can assemble that body. What the people of Martinique want, and at once, is food and clothing. There are, at least, two steamers loaded with food within one hundred miles of St. Pierre, and I am endeavoring, with the assistance of the French Consul and the French Government, to buy, or have the French Government buy for me, all that they contain which is available for use.

ARRANGING TO PURCHASE SUPPLIES.

"We could extend relief at once if we could get hold of these vessels. I understand that in the case of one of them, at least, nearly all the consignees are dead, and there is no one to receive the cargo. If I can make arrangements to purchase I will buy at once and depend upon the Chamber of Commerce to support my action."

One of the steamers to which Mr. Jesup referred was the Madiana, Captain R. Fraser, which sailed from New York with consignments to St. Thomas, St. Croix, St. Kitts, Antigua, Guadeloupe, St. Pierre, St. Lucia and St. Vincent. She arrived at St. Thomas at 8 o'clock Sunday night, the 11th. Of her cargo of 1800 barrels at least 1500 barrels were consigned to St. Pierre and Fort-de-France. Nearly all of it was foodstuffs, such as flour, beef, pork, bread, meal, oleomargarine and lard. The other steamer was the Caribee, which is loaded almost entirely with foodstuffs. She was already due at Barbados. About one-half of her cargo was consigned to Barbados and the other to Demerara.

A. J. Outerbridge, of the Quebec Steamship Company,

said he thought it possible Mr. Jesup might obtain that portion of the cargo of the Madiana consigned to Martinique, but he did not see how he could obtain possession of the foodstuffs on the Caribee. There was no doubt, he said, that many of the consignees of the Madiana cargo were dead. He had been busy all day obtaining from consignors in and about New York the names of persons to whom the goods might be delivered and he thought it possible Mr. Jesup might be able to purchase the entire 1500 barrels. The Caribee's cargo, however, was wholly for Barbados and Demerara, and in both places the inhabitants are in need of food. In Barbados, particularly, owing to the loss of the Roraima, food was wanted.

"We have been compelled," Mr Outerbridge said, "to send the Navigator to Barbados, and will load her so that she can start on May 24th. This is an extra steamer made necessary by the lack of breadstuffs on that island.

SUPPLIES FOR TWO WEEKS.

"In my judgment, the supplies on the Madiana would be sufficient to maintain the survivors of the disaster for two weeks, unless there are a great many more than has been announced. Ordinarily the Madiana would reach Fort-de-France on May 16th, but perhaps an arrangement could be made by which she would go there direct, without stopping at St. Croix, St. Kitts, Antigua and Guadeloupe."

Mr. Outerbridge said that on Saturday the Fontabella, of the Quebec line, would sail for the West Indies, and he had been asked by the United States Government to charter the unused space in that vessel. This privilege had been extended to the officials. A letter, signed by members of the Chamber of Commerce, urging him to call a meeting of that body, was presented to President Jesup. Those who signed the call were Messrs. J. Edward Simmons, Alexander E. Orr, James G. Cannon, Jacob Schiff, Robert M. Galloway, William C. Le Gendre, Eugene De Lane, Lyman J. Gage, Gates W. McGarrah, A. Barton Hepburn, Joseph C. Hendrix and Henry Hentz. Mr.

Jesup had already called the meeting when this request was received.

The Merchants' Association sent this dispatch to President Roosevelt yesterday: "If there is any way in which we can co-operate with the Government, or separately, in aiding in the relief work in Martinique and St. Vincent, you have but to command us."

HOW TO GET TRANSPORTATION.

A similar telegram was sent to the Secretary of War. The Association and the Chamber of Commerce co-operated in the relief of Jacksonville, Fla., and had $1000 left, which would probably be turned over for relief work in Martinique. Association representatives said the principal question in sending supplies to Martinique was one of transportation. Vessels were scarce. William R. Corwine, of the Association tried to get a vessel. Agents of the Red D line expect the Zulia in on May 20th, and say she could be ready to sail on May 22d.

WASHINGTON, D. C., Monday.—Following is the text of the cablegram between Presidents Roosevelt and Loubet on the Martinique disaster:

"WASHINGTON, May 10, 1902.

"His Exellency M. Emile Loubet, President of the French Republic, Paris:

"I pray Your Excellency to accept the profound sympathy of the American people in the appalling calamity which has come upon the people of Martinique.

(Signed) "THEODORE ROOSEVELT."

"PARIS, May 11, 1902.

"President Roosevelt:

"I thank Your Excellency for the expression of profound sympathy you have sent me in the name of the American people on the occasion of the awful catastrophe in Martinique. The French people will certainly join me in thanks to the American people. "EMILE LOUBET."

The Swedish Minister at Paris, H. Akerman, handed to M.

Decrais, Minister of the Colonies, 5000 francs ($1000) for the relief fund, in behalf of King Oscar.

The Czar has telegraphed to President Loubet expressing the sincere sympathy of himself and the Czarina, who shared with France the sorrow caused by the terrible West Indian catastrophe.

Pope Leo summoned the French Ambassador at Rome to the Vatican and expressed to him his keen sorrow on hearing of the St. Pierre disaster. The Pontiff requested that he be kept informed regarding the details of the volcanic outbreak.

King Edward commanded Mr. Chamberlain to telegraph to the Governor of the Windward Islands His Majesty's deep regret at the calamity which had visited the Island of St. Vincent, and his sympathy with the sufferers and the bereaved. The governor was also instructed to spend all the money necessary for their relief. He sent to the French authorities in Paris 25,000 francs ($5,000), as his contribution to the fund being raised for the relief of the sufferers from the Martinique disaster.

FLAGS AT HALF-MAST.

Flags on the French Legation and over the Consulates in Lima and Callao, as well as on numerous private residences, were flying at half mast because of the disaster in Martinique.

Members of only two families in New Orleans were lost in the Martinique disaster. Many years ago a considerable number of colonists came to New Orleans from Martinique, and the descendants of these families have many relatives in the island, but the relationship is so distant that it had been lost sight of. The American Vice Consul at St. Pierre, Amedée Testart, was from this city, and had a sister, Mrs. Carriene, living in Kerlevee street. R. E. Brouilhee, nephew of the Belgian Consul, had four aunts, the Misses Druill, living in St. Pierre, and the cable informed him that there was no hope that they were saved.

William B. Scott, Professor of Geology in the university at Princeton, N. J., made a statement in regard to the eruption in the West Indies, which he says was very much similar to that of Vesuvius, and was probably caused by a rush of water to the lava

reservoir. Professor Scott has spent considerable time in the study of volcanic regions, and is considered an authority on the subject.

He said: "The evidence gleaned from the newspaper accounts is both contradictory and inconclusive. The eruption was of the explosive type similar to Vesuvius, but different in the nature of the matter ejected. In the case of Vesuvius the explosion was great enough to powder the lava; here, however, immense masses of the lava were blown out.

"To this white hot lava can be ascribed the destructive fire in the city and among the shipping in the harbor. The report of a rain of fire was simply this white hot lava. Gases probably did burn, but any fire from this source would have ascended, owing to the lighter weight of the gas. The sudden access of a body of water to the lava reservoir is the only explanation worthy on the present evidence. The eruption is peculiar, in that immense masses of lava were ejected along with the lava stream and that comparatively little volcanic dust was noticed. A force as great as this must have been should have powdered all the lava."

STORY OF JAMES TAYLOR.

James Taylor, of St. Kitts, a cooper employed on the Roraima said: "We left Dominica for St. Pierre at midnight on Wednesday, the seventh, arriving at the latter place about 7 o'clock Thursday morning. The greatest difficulty was experienced in getting into port, the air being thick with falling ashes and the darkness intense. The ship had to grope its way to the anchorage. Appalling sounds were issuing from the mountains behind the town, which was shrouded in darkness. The ashes were falling thickly on the steamer's deck, where the passengers and others were gathered, gazing at the town, some being engaged in photographing the scene.

"Hearing a tremendous report and seeing the ashes falling thicker, I dived into a room, dragging with me Samuel Thomas, a gangway man and a fellow countryman, shutting the door tightly. Shortly after I heard a voice, which I recognized as that

of the chief mate, Mr. Scott. Opening the door with great caution, I drew him in. The nose of Thomas was burned by the intense heat.

"We three and Thompson, the assistant purser, out of sixty-eight souls on board, were the only persons who escaped practically uninjured. The heat being unbearable, I emerged in a few moments and the scene that presented itself to my eyes baffles description. All around on the deck were the dead and dying covered with boiling mud. There they lay, men, women and little children, and the appeals of the latter for water were heart-rending. When water was given them they could not swallow it, owing to their throats being filled with ashes or burnt with the heated air.

THE SEA WAS HOT.

"The ship was burning aft and I jumped overboard, the sea being intensely hot. I was at once swept seaward by a tidal wave, but, the sea receding a considerable distance, the return wave washed me against an upturned sloop to which I clung. I was joined by a man so dreadfully burned and disfigured as to be unrecognizable. Afterwards I found he was the captain of the Roraima, Captain Muggah. He was in dreadful agony, begging piteously to be put on board his ship.

"Picking up some wreckage which contained bedding and a tool chest, I, with the help of five others who had joined me on the wreck, constructed a rude raft on which we placed the captain. Then, seeing an upturned boat, I asked one of the five, a native of Martinique, to swim and fetch it. Instead of returning to us, he picked up two of his countrymen and went away in the direction of Fort-de-France. Seeing the Roddam, which arrived in port shortly after we anchored, making for the Roraima, I said good-bye to the captain and swam back to the Roraima.

"She, however, burst into flames and put to sea. I reached the Roraima at about half-past 2, and was afterwards taken off by a boat from the French warship Suchet.

"Twenty-four others with myself were taken on to Fort-de-France. Three of these died before reaching port. A number of others have since died.

"The following are likely to recover: Miss Stokes and nurse, who were passengers; the purser, Thompson; Third Mate Evans, Second Engineer Morris, Fourth Engineer Venson, Carpenter Eddie Messman and Giuseppi, a sailor. After spending the night in Fort-de France I was picked up by the Korona and brought here."

Samuel Thomas, the gangway man whose life was saved by the forethought of Taylor, said that the scene on the burning ship was awful. The groans and cries of the dying, for whom nothing could be done, were horrible. He described a woman as being burned to death with a living babe in her arms. He said that it seemed as if the whole world was afire.

SHIP SUDDENLY DISAPPEARED.

The inflammable material in the forepart of the ship that would have ignited that part of the vessel was thrown overboard by him and the other two uninjured men. The Grappler, the telegraph company's ship, was seen opposite the Usine Guerin, and disappeared as if blown up by a submarine explosion. The captain's body was subsequently found by a boat from the Suchet.

A. E. Outerbridge, of the Quebec Steamship Company, New York, whose steamer Roraima was lost in the Bay of St. Pierre, Martinique, received the following cablegram from Dominica May 12th:

"Chief officer and assistant purser taken by Korona at Fort-de-France. Engineer Morris and names cabled Saturday are left in hospital at Fort-de-France seriously injured. Muggah and Braun and all others dead. Muggah was captain of the Roraima; the others were members of the crew. The message received by Mr. Outerbridge on Saturday was as follows: "Survivors Roraima on Korona, First Officer Scott and Assistant Purser Thompson; in hospital, Fort-de-France, Morley, second officer; Thompson, third officer; Moores, Evans, second engineer; Benson, carpenter; Mayer, second steward; Leady, mess man; quartermaster; Mrs Reid, stewardess; three sailors."

The following cablegram to Charles Van Romondt, of New

York, was received from Joseph Duvallon, dated Fort-de-France: "St. Pierre totally destroyed. The families Devers and Girard also. Entire city with its inhabitants buried up. Provisions at Fort-de-France requisitioned by the Government. Madame and Mlle. Defurgy saved."

The Colonial Office, in London, received the following cable despatch from Administrator Bell, of the island of Dominica British West Indies:

"The Martinique catastrophe appears to be even more terrible than at first reported. Refugees arriving here this morning say that new craters are open in many directions, that rivers are overflowing, and that large areas in the north of the island are submerged. Other districts are crowded with survivors. Almost total darkness continues. I do not believe Guadeloupe can adequately relieve the stupendous distress."

DESTRUCTION OF COAST VILLAGES

The following despatch was received from Fort-de-France:

"The coast villages near St. Pierre were destroyed simultaneously with that town. The entire island, up to within a few miles of Fort-de-France, is covered with mud and ashes. The cattle of the island are either all dead or dying. The streams have dried up or are polluted. Thousands of persons are flocking to Fort-de-France. Unless relief is promptly sent, famine is imminent, and there is urgent need for the services of the Red Cross Society.

"The French cable line, via Europe, is now the only means of telegraphic communication with the outside world. The demands made upon this line are extremely heavy.

"The terrible explosion which occurred on board the Quebec Line Steamer Roraima probably resulted from kerosene.

"The central and southern parts of St. Pierre are still burning. The country side is deserted. Every family on the island is mourning the loss of relatives or friends. Business is at a complete standstill. St. Pierre was the financial and provisioning centre of the island. Mont Pelée is still in eruption, and even

more violent and disastrous eruptions may follow. Volcanic ashes have fallen, against the wind, on the islands of Dominica and St. Vincent."

"All the latest reports from the West Indies," said one of our newspapers, "tend to confirm and emphasize the horrors of the terrible blow that has fallen upon Martinique. No such appalling disaster, distinguished by the suddenness of the blow, the number of the victims, the completeness of the desolation, has ever come home to the civilized world with so overwhelming and harrowing a force. The convulsion of nature in Krakatoa in 1883 was greater, but it was in a land remote and strange to civilized peoples. The West Indies, on the other hand, are now knit closely to America and Europe by the cable, steamships and the trade and intercourse that brings them near.

THANKS FROM THE FRENCH GOVERNMENT.

"The Government of France, in thanking the United States for the marks of sympathy shown here, requests our aid in transporting the refugees in Martinique from the stricken island, where famine stares them in the face, and President Roosevelt, with characteristic promptness in emergency, has sent a special message to Congress, asking for an immediate appropriation of $500,000 to aid the sufferers.

"The French Government has appealed for aid, and that alone should be sufficient for us to respond heartily and instantly, but there is a more potent reason in the indescribable sufferings of the survivors in Martinique and St. Vincent. Deprived of food and water, all must perish unless help is extended promptly. It is important that within twenty-four hours the appropriation asked for by President Roosevelt be approved by both branches of Congress and made available. Nothing should be permitted to obstruct the passage of the appropriation within the time named. On October 19, 1781, Cornwallis surrendered 'to the combined forces of America and France,' and now an opportunity is offered us to send our forces in aid of France's people in their hour of need.

"It appears from late news that the loss of life in Martinique

will be much greater than was at first reported. St. Pierre, with its 25,000, was completely wiped out, and it is probable that of the 30,000 inhabitants of the surrounding towns, many, if not the majority, have perished. In St. Vincent thousands of persons have lost their lives, and both islands have been laid waste in large part. Plantations in both have been ruined, stock has been killed, crops destroyed, and the means of subsistence have been wrested from the people.

"From present indications, the fertile land in a large part of each island has been turned into a desert by the showers of ashes, stones, lava and volcanic dust, and the inhabitants will be thus bereft of homes as well as goods. In Martinique 50,000 persons are homeless, and the island is incapable of providing for them. The need of assistance in order that famine and disease may be averted is most urgent, and the prompt action of the Army and War Departments, in taking measures to give instant relief, under the direction of the President, will receive universal commendation.

RESPONSE TO APPEALS FOR AID.

"Amid the overshadowing gloom caused by the calamity there is a gleam of light to be seen in the prompt humanity with which all civilized peoples are responding to the appeal for help tacitly made by the suffering survivors of the awful events noted by President Roosevelt as among the most terrible in the history of the human race. The President himself was one of the first to act in the matter, and our Government has answered his call with an appropriation of $200,000, a million francs, which, in the eyes of our neighbors of France and their colonists in the desolated island will seem indeed as it truly is, a munificent donation.

"The several departments of the Government, acting together in harmony with the President, are moving to despatch needed supplies of food and raiment to St. Pierre in the promptest possible manner, and how quickly the American Government can move in such an emergency has been effectively illustrated before now, so that every confidence may be felt as to relief being afforded where it is most needed within a very short time.

"Local governmental authorities everywhere are following the example so well offered in Washington, and it is to be noted with satisfaction that our own city (Philadelphia) is, as usual in such cases, among the first to take effective action. We have, fortunately, an organization ready for work on such occasions, prepared and equipped to move on the instant whenever a call comes like this sounding to us from Martinique.

The Permanent Relief Committee has been summoned by the Mayor of the city to meet at his office for the purpose of directing and controlling the helpful impulses always inspiring our people in such extremities. The Permanent Relief Committee has a reserve fund at its command, which can be instantly used, and the avenues of subscription to enlarge its means of usefulness, always open and always commanding the confidence of the community, are already bringing in important contributions.

"It is a most fortunate circumstance that we do not have to wait to find the ways and means for extending help on occasions like the present. Our people are not only willing, but they are ready. The machinery for collecting and distributing aid can be set in motion on the instant, and we know by experience how effective is the work it can be trusted to accomplish. It is absolutely certain that every dollar contributed will be used by the Permanent Relief Committee to do the utmost work in the best possible way. The impulse to give which will stir the heart of every humane person in the community will be made, through the means established, to serve its purpose in conferring the greatest good upon the greatest number."

CHAPTER VI.

TWO THOUSAND PERSONS KILLED IN ST. VINCENT.—GREAT ALARM AS TO THE FATE OF THE ISLAND.—AWFUL SUDDENNESS OF THE CALAMITY AT ST. PIERRE.—GRAPHIC STORIES TOLD BY WITNESSES OF THE DEADLY EXPLOSION.

CONDITIONS on the British Island of St. Vincent were reported on May 13th to be more serious. The following despatch furnished important information :

"United States Goverment tug Potomac leaves here to-night for the Island of St. Vincent, where conditions are reported to be worse. La Soufriere, on St. Vincent. was in full eruption May 10. A stream of stone and mud half a mile wide was then issuing from the volcano. Stones two inches in diameter fell twelve miles away. At Kingstown, the capital of the island, the ashes were two inches deep. Seven hundred dead were reported Sunday, May 11. It is estimated that the total number of deaths at St. Vincent reaches two thousand. Most of the victims are said to be Carib Indians. Seven estates on the island have been burned to ashes, and it is authentically reported that two earthquakes occurred there. It is believed the submarine cables in St. Vincent have been broken by the disturbances. The present volcanic eruption on St. Vincent is the first since 1812.

"Great alarm continues to be felt at St. Thomas regarding the fate of St. Vincent. Communication has been cut off since Sunday, the 11th. At that time the Soufriere was in furious eruption. Kingstown, on the opposite end of the island, was being bombarded, stones and ashes falling in an unceasing shower. The northern part of St. Vincent had been utterly destroyed. Before Sunday morning the deaths numbered 1600, and it is feared that this estimate is far too small.

"Much excitement was caused by a slight shock of earthquake, which was felt about 4.30 on the afternoon of May 13th. The public was greatly excited, and many rushed out of their

houses, but the tremors of the earth stopped before any actual damage was done."

"I have just returned from the ruins of St. Pierre," writes a correspondent, "unable longer to withstand the terrible hardships and encounter the horrible sights that were with me every minute of the twenty-four hours of my stay there. When I reached St. Pierre I was surprised that more of the dead were not in sight. Not more than a thousand bodies were strewn along the streets, the others being at least partly buried under the mantle of ashes and cinders spread by Mont Pelée.

"Every moment of my stay in St. Pierre I feared that the volcano would again belch forth its billows of death-dealing fire. It continues active, vomiting lava in streams, which flows down its sides, changing the surface of the northern end of the island every hour. It is the stench and the danger of pestilence that makes St. Pierre a place of even greater horror than was caused by the first result of the explosion of Mont Pelée.

BODIES BURIED BY SOLDIERS.

"All of the bodies first found on the surface have been buried by soldiers, but few of those in the ruins have been dug out. It will require months, unless a greater force of men is employed, before the dead are properly disposed of. The sand and ashes that cover the city are still hot. Waves of heat come down from the crater of the volcano, making work among the ruins difficult, when it is not absolutely impossible.

"Reports that all of the inhabitants of the village of Le Precheur had been brought to this city are not true. A great wave of lava swept across one portion of the village, destroying the lives of about 800 inhabitants. The others fled to the seashore, and were rescued by the French cruiser Suchet. Other villages at the foot of Mont Pelée were destroyed by the lava, which flowed along the courses formerly followed by the rivers.

"Indignation against Governor Mouttet grows as the panic of the survivors subsides. It is remembered that while Mont

Pelée was threatening and giving warning of the disaster it was about to work, the Governor refused to permit any general exodus from St. Pierre. Some food has been brought here from the neighboring islands, but famine still continues to threaten the refugees. All are on half rations, and, when it is remembered that pestilence is an immediate menace, it can be understood why there should be plenty of food to give those who may be attacked strength to fight the disease.

SOLDIERS GUARDING THE DEAD.

"Vandalism has already begun at St. Pierre, and although soldiers are trying to guard the dead, looting is going on in a shameful manner. Announcement will soon be made providing severe penalties for all who are caught stealing in the island. The Potomac, a United States Government tug, sent from San Juan, Porto Rico, which arrived here to-day, brought in five negroes and one white man who had been picked up in a small boat off St. Pierre. All of these men were loaded down with jewelry, which had been taken from the bodies in St. Pierre. They have been turned over to the French authorities for punishment.

"The Potomac brought a ton of supplies to Martinique, consisting in part of codfish and flour. While off St. Pierre the Potomac encountered a column of thick smoke, through which she could not pass. The tug was compelled to go five miles out of her course to escape the ashes that were falling in clouds.

"In the harbor of St. Pierre a steamship is in constant readiness to take away the workers if Mont Pelée becomes more threatening. A watch is constantly maintained ready to give warning, and if the lava turns in the direction of St. Pierre the place will be immediately deserted. Aside from those working in the ruins there is not a human being in the northern part of the island. All who have not been killed have fled to Fort-de-France."

The Transatlantic steamer Canada arrived at Port of Spain, Trinidad, with 138 refugees, twenty hours from Fort-de-France, Martinique. She brings this account of an event preceding the

disaster at St. Pierre, and also of the catastrophe itself as told by eye witnesses, who were on the schooner Gabrielle:

"A scientific commission, presided over by the Governor, M. Mouttet, assembled in St. Pierre on May 7, the day before the calamity, for the purpose of studying the phenomena of the volcanic disturbances of Mont Pelée. It was agreed by the members of this commission that the relative position of the craters and the valleys debouching on the sea were such that the scientists could affirm that the security of St. Pierre was complete, and this announcement was made to allay the fears of the frightened citizens.

GREAT COLUMN OF STEAM.

"The sun rose clear over St. Pierre at 6 o'clock on the morning of May 8th. Mont Pelée was smoking to the north, and the wind was blowing westward. A few minutes before 7 o'clock a great white column of what seemed to be steam and gas belched forth from an apparently new crater on Mont Pelée, which seemed to be about 200 yards from the original crater, and which appeared to open up a deep rent from the top to the bottom of the mountain. The outbreak caused the utmost consternation and panic among the inhabitants of St. Pierre, who fled toward the seashore, uttering frightful screams, in anticipation, evidently, of what was to follow.

"Those on the Gabrielle observed a small steam yacht leave St. Pierre at ten minutes after 7 o'clock, with the Governor and members of a scientific commission on board. The yacht steamed toward Le Precheur. A terrible groaning was heard from the volcano, about ten minutes before 8 o'clock, and a moment later a gigantic mass of thick, impenetrable black smoke poured out of the crater and fell with frightful rapidity upon the city. In a very short time the whole city was a mass of ruins.

"The waters of the harbor were violently agitated and everywhere was heard the sound of falling masts of the shipping, and vessels were seen to overturn and sink or burst into flames. The cries of the doomed beings on shore and afloat lasted only a few moments, when the stillness of death fell upon the city and the

harbor. Only three vessels of all the shipping in the harbor had withstood the terrible convulsions of nature. These were the little schooner Gabrielle, the Korona and the North American.

"One of the survivors who was brought here says he sprang overboard, and despite injuries received from the falling lava and ashes succeeded, by diving and swimming for two hours, in sustaining himself until he was picked up by the French warship Suchet.

"Although the volcano's flow had apparently diminished somewhat when the Suchet left, great blocks of lava were still being vomited forth from the crater. Nothing remained of the city of St. Pierre except vast heaps of smoking ruins, resembling a great furnace. Here and there in open space large numbers of partly burned and asphyxiated bodies could be seen lying on the ground. An expedition carrying relief supplies left Trinidad for Martinique on May 10th, and is expected to return within the next twenty-four hours.

RESIDENTS PREVENTED FROM LEAVING.

"The Governor, thinking all danger over after the eruption of lava to a height of 120 feet on May 5, formed a cordon of soldiers around the city to prevent residents from leaving. To further allay excitement the Governor took up his residence with several scientists in St. Pierre. It will take thousands to dig out and bury the dead. The smell of burning flesh is perceptible three miles from shore. The Roraima was still burning yesterday, and the ruins of the city will burn for weeks longer. Food for the survivors has been sent from St. Thomas and Barbados for 12,000 refugees, who are in outlying villages.

"As a result of the measures taken by the authorities, access to St. Pierre is now easier. The ruins of the town have ceased smoking. Two thousand corpses have been found in a carbonized condition. It has been learned that the rain of fire ceased at a distance of 200 yards from the village of La Carbet.

"Talk with survivors of the disaster confirms previous statements as to the awful suddenness of the catastrophe. It is thought

that an enormous quantity of gas was liberated, producing great atmospheric pressure, which overwhelmed everything before it. The gases absorbed by the bodies of the victims caused them to burst, and the fire coming afterwards carbonized them. This was followed by a rain of stones, which enveloped the town, but there was not, as has been said, any flow of incandescent lava. A gardener at the village of Morne Rouge, saw, at the moment of the disaster, seven luminous points on Mont Pelée. He says he had the impression of being violently drawn towards the volcano by a powerful current of air. Then the mountain opened, according to the description of the gardener, and flung tornadoes of fire at St. Pierre.

BUSINESS IN THE TOWN SUSPENDED.

"Business at Fort-de-France is suspended. The people of the city have assembled in the churches, and the cathedral, where special services are being held for the St. Pierre dead, has been thronged since daylight.

"A famine here is imminent. The northern section of the island is depopulated. Provisions are needed here immediately for 100,000 people. A ship load of lime is also needed at St. Pierre for sanitary purposes. The stench there from the dead bodies is overpowering. Governor Hunt, of Porto Rico, has asked Louis H. Ayme, the United States Consul at Gaudeloupe, who is now here, what assistance he could render. Governor Hunt's offer has been communicated to the Government which will gladly accept it.

"Great praise is given United States Consul Ayme. He has worked indefatigably to succor the survivors. He has bandaged the limbs of the wounded and has worked without sleep and without food. He is now thoroughly exhausted. Forty persons rescued from the city are now in hospitals here. In addition to the specie already secured, jewels to the value of 1,000,000 francs were rescued from the Bank of St. Pierre yesterday. The Italian consul at Barbados has recovered the body of his daughter, who was visiting in St. Pierre at the time of the disaster.

"The French cruiser Suchet is here, and the city of Fort-de-France is quiet. It was reported here yesterday from the British

Island of Dominica that 300 survivors of the St. Pierre disaster had reached there in canoes.

"Strange to relate, in view of the number of inhabitants of St. Pierre who were swept to death by the volcanic waves from Mont Pelée, on Thursday last, very few corpses have been found by those who are engaged in the work of cremating the dead bodies. This is due to the fact that the most populous quarters of the town are buried under a thick layer of cindered lava, which apparently entirely consumed the bodies of the victims.

"Many strange and incomprehensible incidents are recounted of St. Pierre. The charred remains of a woman with a silk handkerchief, unburned and in perfect condition, held to her lips have been found there. The crisped bodies of young girls have been found, but the shoes they wore were unhurt. The path of the volcanic torrent which swept over St. Pierre is marked out in a strange manner. The vicinity of the shore, where the vessels anchored, was swept by a whirlwind of volcanic gas, which ripped, tore and shattered everything in its passage, but left few traces of cinders behind. On the other hand, the fort centre and adjoining parts of St. Pierre are buried under a thick bed of cinders which consumed everything beneath it.

SUCCORING THE REFUGEES.

"The work of succoring the refugees continues incessantly. When the cable repair ship Pouyer Quertier, Captain Thieron, started on her mission of mercy she had to pass through clouds of burning cinders, at the risk of catching fire, in order to reach the terror stricken people ashore. But, as already announced, she succeeded in bringing to this port 456 people, mainly former residents of the village of Le Precheur. This was on Saturday last. Since then the steamer, as the result of other daring trips, has succeeded in bringing many other persons to Fort-de-France. On Sunday, the 11th, she rescued 923 persons and piloted the French cruiser Suchet and the Danish cruiser Valkyrien, who took on board 1500 persons. The Valkyrien, having done everything possible in the efforts being made to succor the refugees,

left this port to-day. The German cruiser Falke has just arrived here.

"The Pouyer Quertier has distributed to the sufferers large quantities of biscuits, milk, wine and cheese. The specie found in the vaults of the Bank of Martinique at St. Pierre, amounting to 2,000,000 francs, has been brought safely here. The specie in the public treasury at St. Pierre is still buried under a layer of lava about six to eight yards thick.

TERRIBLE EXPERIENCES OF THE SURVIVORS.

"Public interest centres in the stories of the survivors and in the efforts being made to succor the refugees. A woman named Laurent, who was employed as a servant at St. Pierre in the household of M. Gabriel, and who was among those taken to the hospital in this city, in describing her experiences said that on the day of the terrible disaster she heard a loud report, and thereupon fainted. When she regained her senses, a few hours later, she was horribly burned, and, glancing around, she saw two members of the Gabriel family still alive, but they died before assistance could reach them.

"Mlle. Laurent, although she lived for some time after being taken to the hospital and was conscious while under the care of the physicians, died without being able to impart any additional information concerning the catastrophe.

"Margaret Stokes, the nine-year old daughter of the late Clement Stokes, of New York, who with her mother, a brother aged four, and a sister aged three years, was on the ill-fated British steamer Roraima, is in the hospital here. The child is not expected to live. Her nurse, Clara King, tells the following story of her experience:

"'She says she was in her stateroom when the steward of the Roraima called out to her, "Look at Mont Pelée."

"'She went on deck and saw a vast mass of black cloud coming down from the volcano. The steward ordered her to return to the saloon, saying, "It is coming." Miss King then rushed to the saloon. She says she experienced a feeling of suffocation,

which was followed by intense heat. The afterpart of the Roraima broke out in flames. Ben Benson, the carpenter of the Roraima, who is in the hospital here, severely burned, assisted Miss King and Margaret Stokes to escape. With the help of Mr. Scott, the first mate of the Roraima, he constructed a raft with life preservers. Upon this Miss King and Margaret were placed

"'While this was being done Margaret's little brother died. Mate Scott brought the child water at great personal danger, but it was unavailing. Shortly after the death of the little boy Mrs. Stokes succumbed.' Margaret and Miss King eventually got away on the raft, and were picked up by the steamer Korona. Mate Scott also escaped. Miss King did not sustain serious injuries. She covered the face of Margaret with her dress, but still the child was probably fatally burned.

"The only woman known to have survived the disaster at St. Pierre was a negress named Fillotte. She was found in a cellar, where she had been for three days. She was still alive, but fearfully burned from head to toes. She died in the hospital.

PITIABLE CONDITION OF RORAIMA SURVIVORS.

"All the survivors of the St. Pierre disaster continue to be greatly broken by the terrible experience through which they had passed. First officer Scott, Assistant Purser Thomas and Cooper Taylor are still in a pitiable condition. Scott, who lost a son who was about to enter college, cannot take his mind from the scenes of last Thursday. He was the last to leave the dead-strewn deck of the Roraima, which was then burning itself out. All three men speak in the highest terms of Captain Pierre Lebris of the French cruiser Suchet, whose kindness to the survivors endeared him to them."

The Martinique calamity was the subject of discussion at the Cabinet meeting in Washington May 13th. The prompt and effective response of the supply departments of the army, and the readiness with which the navy responded to the demands made upon it, were very gratifying. The fact that the Commissary Department was able to expend the allotment of money assigned

to it, and to collect the stores purchased and make them ready for transportation, and the equal readiness of the Quartermaster's Department and that of the Surgeon General to perform the duties assigned them, showed the efficiency and thoroughness of organization of the supply service of the army.

The plans of both War and Navy Departments were so comprehensive and carried out with such promptness and intelligence that even before the passage of the joint resolution authorizing the expenditure of $200,000 the entire amount had been practically expended the greater portion of the materials assembled for instant delivery to those in charge of the sea transportation.

The large collection of military stores of every description on hand was of invaluable assistance in this emergency. The extent of the work done in so short a time will be better understood when it is known that the Commissary Department, acting upon advices from the stricken islands, proceeded to assemble rations sufficient to supply 40,000 people for a period of fourteen days.

$500,000 FOR RELIEF.

The latest despatches received from the West Indies indicated that the extent of the disaster was even greater than was at first reported, and that the condition of the survivors was such that immediate relief was imperative. Thousands would perish for lack of subsistence unless relief reached them in the shortest possible time, and, the United States being the nearest source from which substantial and efficient relief could be obtained, the President and the Cabinet became convinced that the liberal appropriation of $200,000 already made would not be sufficient to meet the emergency, and that a further appropriation of $300,000 would be required.

This conclusion was communicated to a number of Senators and Representatives, with the result that the Senate early in the afternoon promptly responded and voted an additional $300,000. It was also decided at the Cabinet meeting that an appeal should be made to the country, especially as telegraphic inquiries had come to the State Department from individuals and municipalities

asking how contributions might be made for the relief of the stricken people of the islands. This was met by the preparation of an appeal from the President and the selection of well known individuals at various points throughout the country to receive and forward subscriptions in money and contributions in supplies of food and clothing.

AN APPEAL TO THE COUNTRY.

Following is the appeal issued immediately following the Cabinet meeting:

The President has appointed a committee to receive funds for the relief of the sufferers from the recent catastrophe in Martinique and St. Vincent. The gentlemen appointed from each city are asked to collect and receive the funds from their localities and neighborhoods as expeditiously as possible and forward them to Mr. Cornelius N. Bliss, Treasurer of the New York committee, which committee will act as central distributing point for the country.

The President directs all the postmasters throughout the country, and requests the presidents of all the national banks, to act as agents for the collection of contributions, and to forward the same at once to Mr. Bliss, at New York. The postmasters are also directed to report to the Postmaster-General, within ten days, any funds collected on this account.

The President appeals to the public to contribute generously for the relief of those upon whom this appalling calamity has fallen, and asks that the contributions be sent in as speedily as possible. The gentlemen designated on the several committees are requested to act at once. The following are the committees:

New York—Cornelius N. Bliss, Treasurer; Morris K. Jesup, John Claflin, Jacob H. Schiff, William R. Corwine.

Boston—Augustus Hemenway, Dr. Henry S. Pritchett, Henry Lee Livingston.

Philadelphia—Charles Emory Smith, Provost Charles C. Harrison, Joseph G. Darlington, Clement M. Griscom, John H. Converse.

Baltimore—James A. Gary.

Washington—Charles C. Glover.

Pittsburg—A. J. Logan, H. C. Frick.

Buffalo—John G. Milburn, Carlton Sprague.

Cleveland—Myron T. Herrick, Samuel Mather.

Cincinnati—Jacob G. Schmidlapp, Briggs S. Cunningham.

Chicago—J. J. Mitchell, Marvin Hughitt, Marshall Field, Graeme Stewart.

Milwaukee—F. G. Bigelow, Charles F. Pfister, Fred Pabst.

Minneapolis—Thomas Lowry, J. J. Shevlin.

St. Paul—Kenneth Clark, Theodore Schurmeier.

Detroit—Don M. Dickinson.

St. Louis—Charles Parsons, Adolph Busch, Robert S. Bookings.

Louisville—Thomas Bullitt.

Atlanta—Robert J. Lowry.

Kansas City—W. B. Clark, Charles Campbell.

Omaha—John C. Wharton, Victor B. Caldwell.

Denver—D. H. Moffatt.

San Francisco—Mayor Schmitz, George A. Newhall, A. Sbardoro, Robert J. Tobin, Henry T. Scott, A. A. Watkins.

New Orleans—Hon. Paul Capedeville, I. L. Lyons, S. T. Walmsley.

EXTENDING IMMEDIATE RELIEF.

This appeal was supplemented by a statement from a representative of the newspaper press:

"The commanding officer of the military forces in Porto Rico was informed by cable of what had been done for extending immediate relief, and directed to send to Martinique all the subsistence stores and clothing that could be spared, and to use every effort to assist in the work of relief. The collier Sterling is at San Juan about ready to sail, and the stores will be carried by that vessel to St. Pierre or such other points in the afflicted district as may be found necessary to reach the sufferers. Admiral Bradford, of the Bureau of Equipment, is prepared to send vessels

carrying fresh water to Martinique to relieve the pressing need.

"Tenders fitted for carrying fresh water are now at Norfolk and Pensacola, and have been instructed to hold themselves in readiness for sailing. Admiral Bradford has also tendered the use of the vessels employed in carrying coal for the navy. There is quite a fleet of vessels of this class, and several of them can be made immediately available for carrying supplies to Martinique and taking off the sufferers from the island.

"In addition to the Sterling now at Porto Rico, loading for Martinique, the Lebanon is at Cienfuegos, about three days' run from Martinique. The Leonidas is at Port Royal, S. C., discharging coal. The Hannibal is at Lambert's Point, near Norfolk, with a load of coal, ready for sea. The Marcellus is at Norfolk in condition to be placed in commission within a few hours after receiving orders. Each of these ships can carry from 2000 to 3000 tons of supplies.

SCIENTIFIC INVESTIGATIONS.

"A number of scientists will sail on the Dixie for the purpose of making inquiries into the volcanic disturbances. Professor Robert Hill left here this afternoon for New York. Professor Hill has been a frequent visitor to Martinique, and is well acquainted with the geological nature of the country. He will be accompanied by C. S. Borchgrevinck, a recognized authority on seismology and volcanoes, having given particular attention to the volcanoes of Erebus and Terror, on the Antartic Continent, south of New Zealand. It is probable that Professor Alexander Graham Bell will also be of the party. Professor Hill will represent the Geological Survey, and at the same time will be a representative of the National Geographical Society.

"Captain Southerland, Chief of the Hydrographic Bureau of the navy, is planning to undertake immediately, with the approval of Admiral Bradford, a series of hydrographic surveys. If the current reports as to the tremendous subsidence of the sea bottom near the Antilles are accurate, then there have undoubtedly been corresponding upheavals of the bottom in other sections

which have created great menaces to navigation through the fact that they are not yet chartered.

"Captain Southerland points to a curious fact, namely, that a year ago there was what might be regarded as a premonitory sign of the tremendous disturbance which has just taken place in the earth's crust. The 'Notice to Mariners,' of June 8, one year ago, contains the following note:

"'Captain J. Thomas, of the schooner Kate, reports that May 5, about thirty-two miles eastward from the south point of Martinique, the sea rose with great fury, breaking as if on rocks. This continued for about four hours; then the sea became quite smooth again. The schooner labored very heavily, sustaining slight damage, and was uncontrollable during the phenomenon, the light airs from the southeast not giving her steerage way. No current was observed. The weather was fair.'"

APPEAL OF THE RED CROSS.

General John R. Wilson, of the Red Cross Society, was directed at a meeting of the Executive Committee of the Association in Washington to issue the following public appeal for aid for the sufferers from the Martinique disaster:

"The American National Red Cross appeals to the people of the United States to send money and supplies in aid of the sufferers at Martinique and St. Vincent. The unparalleled calamity needs no words of ours to cause you to offer aid. Money and supplies can be sent to the Hon. Cornelius Bliss, of New York city, or money may be sent to W. J. Flather, the treasurer of the National Red Cross Association, at Riggs Bank, Washington, D. C.

"All such contributions, whether in money or supplies, intended for the Red Cross, should be so marked.

"JOHN M. WILSON."

This action followed a meeting of the Executive Committee at the State Department and subsequently a meeting of the delegation with the Secretary of War, to ascertain what way the Red Cross could aid the Government in its work of relief. The Presi-

dent expressed himself as pleased with the action of the Association, and said he would be glad to have the Red Cross issue an appeal to the country, and to have such other co-operation as the Association might deem best to give. The Secretary of War also expressed himself in the same vein.

Miss Clara Barton, the President of the Red Cross, was on the way to St. Petersburg as a delegate from the United States to the Red Cross Convention there.

NEW YORK RELIEF ON AMPLE SCALE.

President Morris K. Jesup, of the Chamber of Commerce, held a conference in the afternoon of May 14th at the Chamber with Edmond Bruwaert, the French Consul General; H. O. De Medeuil, of the American Trading Company; A. E. Outerbridge, the New York agent of the Quebec Steamship Line; Henry Hentz and others interested in the trade with Martinique. After the conference, Mr. Jesup announced that he had made arrangements to ship by the steamship Fontabelle, of the Quebec Line, which was to sail on Saturday, the 17th, supplies best adapted to the immediate needs of the survivors, the quantity to amount to the equivalent of the space of 1000 barrels. This precaution was taken, Mr. Jesup said, so that in case there should be any delay in the sailing of the Dixie, or in a case of any accident to the vessel, the inhabitants of Martinique would be cared for as speedily as possible.

This action, together with that taken in ordering the purchase of the supplies aboard the steamship Madiana, on the arrival of that ship at Fort-de-France to-morrow, Mr. Jesup said he thought would go far towards providing for the immediate necessities of the people who survived the eruption.

The Fontabelle, in addition to taking 1000 barrels of supplies from the Chamber of Commerce when it sailed Saturday, would take quantities of stores from private firms who have interests in Martinique, and who were arranging to send supplies for distribution on the island.

The munificent appropriation of the United States Congress

for the relief of the sufferers from the Martinique disaster, President Roosevelt's message recommending a vote of half a million of dollars for that purpose, and the action of the United States Government in despatching war vessels and food supplies to Martinique, etc., were referred to in the House of Commons, London, by John Dillon, Irish Nationalist, who asked the government leader, A. J. Balfour, whether, in view of the action of the United States and the fact that a British colony had suffered so greatly, Great Britain intended to adopt similar relief measures. He was sure, he said, that a vote in this connection would be carried unanimously.

Mr. Balfour said that the matter had been under the consideration of the Cabinet. He had never heard of a vote of such character being suggested in Parliament. Of course, he said, everybody felt the extraordinary gravity of the situation and the tremendous suffering caused by the appalling calamity. Every assistance that could be given locally by the government would be given.

"FRANCE WILL NEVER FORGET."

Many American firms and individual Americans subscribed to the Martinique fund in Paris 10,000 francs ($20,000).

The "Temps" in an editorial referring to the action of the American Congress in appropriating $200,000 for the relief of the Martinique sufferers, said: "This manifestation of American sympathy on the eve of the Rochambeau fêtes tends to draw tighter the already close ties uniting the two Republics and constitutes a guarantee of peace and of the fraternity of the two nations. France will never forget the spontaneous initiative of President Roosevelt, or the significant generosity of the Congress."

The Government of the Netherlands ordered the Dutch warships, Konigin Regentes to proceed from the island of Curacao to Martinique at full speed, in order to assist the sufferers from the eruption. Both Chambers of the States General have passed resolutions expressing sympathy with France.

King Victor Emmanuel contributed 25,000 lire ($5,000) to the fund being raised for the relief of the sufferers from the Martinique disaster.

Shocked by the news of the disaster at Martinique, which had destroyed his residences, warehouses and stores in St. Pierre, James H. Hamlen, an aged merchant of Portland, Maine, sat silent and amazed on the pier, after leaving the Kaiser Wilhelm der Grosse in New York, in which he had arrived from Europe. Accompanied by his daughter, Mr. Hamlen left Martinique on March 28 because of Miss Hamlen's ill health and the prevalence of fever.

"We had a home in St. Pierre and another in Morne Rouge, nearer the mountain," said Miss Hamlen. "These were filled with valuable curios and mementoes of the islands, which money cannot replace. All these and my father's places of business are swept away. The loss to us will reach $100,000. We had many friends among the white people there, including the American and English Consuls. We usually remained on the island until the middle of May. My illness proved our salvation."

OVERCOME BY THE TERRIBLE NEWS.

Mr. Hamlen was so overcome by the news that he could not talk. The father and daughter went at once to Portland, Maine, where a bark bearing the merchant's name was taking on her usual cargo for the island.

The situation was summed up by a leading journal as follows:

"Despatches from Martinique are beginning to give more attention to the living than to the dead, and have become more urgent in their calls for food supplies for refugees. St. Pierre was the storehouse for the entire island, and all of its supplies have been destroyed or buried under lava. In addition a large tract of country has been laid waste by ashes, thus depriving the surviving inhabitants of vegetable and meat supplies, for the cattle are reported to be dying of starvation.

"Nearly a week has elapsed since the great eruption, and another week must pass before vessels from New York or Europe can get to Martinique with supplies. The other islands of the West Indies, however, have surplus food that could be sent to Martinique in a day or two, and thus afford relief until the arrival

of the larger supply ships sent from American and European ports. To utilize the supplies that are near at hand, however, money is needed, and, fortunately, money can be sent by cable to Porto Rico and other West Indian islands.

"The Dixie will carry supplies sufficient to maintain 50,000 people for several days. The arrival of the Dixie will put an end to all danger of famine in the regions that can be reached by distributing agents, for before her supplies have been exhausted other vessels will be sent out. The weak point in the relief service is the distance, but several vessels are on the way to Martinique, among them, it is reported, the collier Sterling from Porto Rico, with navy stores on board.

"The streams on the island have been so polluted that fresh water, as well as food, is needed, and two barges carrying supplies of water are about to start from Key West and Norfolk. The prompt action of President Roosevelt in getting ready to ship supplies while Congress was preparing to pass an appropriation has saved forty-eight hours, but there should be no relaxing of effort to get supplies to the people until all danger of famine or plague has been removed.

GREAT TAX ON PUBLIC CHARITY.

"Then the work can proceed in a more leisurely and orderly way. The probabilities are that the world at large will be called upon to support 50,000 people for at least six months, and that is no small task. But we need not concern ourselves at present with the magnitude of the undertaking. The important thing is to get the relief work started, and that can be done as soon as there is money in hand. The United States Government will send an abundance of supplies available possibly a week hence; but private contributions will probably yield immediate results. The Senate adopted a resolution appropriating $500,000 for the volcanic sufferers, which includes the $200,000 already appropriated."

Merchants and ship captains who know the Windward Islands cannot conceive of the gay little port of St. Pierre de Martinique covered with ashes and lava, says the New York

Post. As do all the colonial capitals of the French, St. Pierre followed as closely as the steamers and mails would permit the customs and fashions of Paris. At the Hotel des Bains, at the "absinthe hour," one might always find a gathering of young men of the town, who sat sipping their liqueurs and chatting gaily.

Where St. Pierre was the coast line curves inland like a slightly bent bow. Describing it, one of the shopkeepers on the Rue de Victor Hugo used to say that the town was situated on a bay shaped like a dilemma, with a volcano on one horn and a tropical jungle on the other. He had got the phrase from an English correspondent, who had wondered what the inhabitants would do if such a calamity as the present one ever occurred. The Englishman had noted the lack of roads leading from the town and the futility of any hope of escape.

SITUATION OF THE TOWN.

The town was built on the flat, narrow foreshore, that lay between the foot of the steep wooded mountains and the sea. The houses and shops were built down to the water's edge, and clustered in irregular groups about the Cathedral, which was situated directly opposite where the ships lay in the roadstead, and was the prominent architectural feature of the town. It was built of a whitish stone, and with its two towers, in which bells were hung, was sharply accentuated against the green background of the mountains.

The water front of the town extended for nearly two miles along the gently curving coast. All the space back to the hills that shut in the town was filled with the low white houses of the people. Some twenty or twenty-five streets ran down from the hills to the water front. These were cut by irregular cross streets.

The Rue de Victor Hugo was the principal thoroughfare. All of the best shops were located on it, and it served as a parade for the fashionables when they made their appearance in the cool of the evening, arrayed in the white ducks, Panama hats and low cut patent leather shoes, and the women either in the year

old fashions of Paris or in the striking, gaily colored native garb.

The Cathedral, the Opera House (where traveling companies played before enthusiastic audiences), the Hotel des Bains and the banks were probably the largest and best built buildings in the town. French was the common language, and nearly all of the white people were of French extraction. It was a lively little place, and its people had some of the light spirit and gaiety of their Gaelic kinsmen.

Always on coming into the harbor parties noted the apparent freshness and cleanliness of the place. The white houses, with their green blinds and tiled or thatched roofs, the gay striped awnings and vivid green of the background, made a cool, pleasant picture. Ashore, the bright costumes of the native girls, the movement of the street life and the strangeness of the new scenes was a source of constant interest to tourists.

The upper or new town was the most attractive part of the place. The streets were broader and cleaner, and the buildings of a better quality. All of the streets were narrow, the principal one (the Rue de Victor Hugo) being scarcely wide enough to permit two carriages to pass abreast.

PROUD OF THE VOLCANO.

Through every street ran an open gutter of water from the hills, and early in the morning, just when the cool dawn wind was coming down from the mountains, these gutters would be alive with people. The native women would bring out their tall earthen jars, called "Welsh hats" by the resident Englishmen, to be filled with cool flowing water. Babies were brought out and allowed to disport themselves, while their mothers cleansed the household utensils. The streams being fed from mountain lakes, cleanliness in dress and habitation was common, even among the lowest classes.

Back from St. Pierre, about eight miles on a winding mountain road, was a fashionable native resort, Morne Rouge. Here the rich residents had their country homes, and it is probable that

HAULING SUGAR CANE, SCENE IN MARTINIQUE

SCENE ON THE DRIVE TO MORNE-ROUGE, NEAR ST. PIERRE

STREET IN FORT DE FRANCE, MARTINIQUE

TROPICAL GARDEN NEAR KINGSTOWN, ST. VINCENT

VIEW OF KINGSTOWN HARBOR, ISLAND OF ST. VINCENT

COPYRIGHT. 1898, BY ROCKWOOD, N. Y.

THEODORE ROOSEVELT

when the flood of fire, lava and ashes came down from Mont Pelée these were among the first houses destroyed. In the season, which began about June 1, there were usually 4000 or 5000 persons at Morne Rouge. Probably half that number had gone out this year to open their villas.

The people of St. Pierre were rather proud of their volcano. Mont Pelée stood first as a "point of interest" for tourists. There has always been plenty of evidence that life was not extinct in Mont Pelée but the easy-going inhabitants believed the volcano was in its dotage, and its occasional weak mutterings only gave it added value as a show place; the manifestations were never taken seriously. Not since the end of the eighteenth century and again in 1851 had there been even weak eruptions. It is evident that during all the years the volcano has been gathering strength and that mighty forces have been at work. Despatches from St. Thomas on Saturday, May 3rd, announced that St. Pierre had been covered with ashes to the depth of one-quarter of an inch as the result of an outbreak on Mont Pelée. A second despatch said the overflow of lava had destroyed the big Guerin sugar factories at the base of the mountain and near the northwest edge of St. Pierre. It is evident that these warnings of the disaster that was to come did not alarm the people of St. Pierre.

NO CHANCE OF ESCAPE.

When the head of Mt. Pelée blew off, the inhabitants of the town below had no chance of escape. The burning lava, the ashes and mud and the fire came down the hills as the water had been coming for hundreds of years, and the people below were caught as fish in a net. The only way was the sea, and that offered nothing but death by drowning. On the side of the town away from the volcano the tropical undergrowth came to within a few yards of the houses, and the beach ended at the city limits.

There were no wharves or quays at St. Pierre, and really no harbor—simply an open roadstead with deep water inshore. The island rises sheerly from the sea, and there was no anchorage until the ships got within 300 feet of the buildings on shore. Skippers of

sailing vessels would take their ships close in and anchor with bows pointed seawards and with a stern line out to steady the craft. They had to be alert during the rainy or stormy season, because of their exposed condition, and be ready to slip anchors and run out to sea.

According to despatches, this is what the British steamer Roddam did when the town was destroyed. Though she had a full head of steam on, seventeen of her crew were killed in running out, and the vessel was partially wrecked. The sailing craft in the harbor didn't have a ghost of a show to get away. There were usually from eighteen to twenty-five vessels in the harbor at this season of the year, anchored in a long line along the water front.

What happened when the floods of fire and lava came down will be related later, but every one who knew the town and its people can easily imagine the scenes of wild horror that must have been enacted when the excitable people realized that escape was impossible.

The chief exports of Martinique are sugar, rum and cocoa. Owing to the low price of sugar which has prevailed in recent months, the island has suffered very greatly. The island buys of the United States such articles as butter, oatmeal, tobacco, vegetables, horses and mules, coal, harness, wagons, machinery, etc. The city of St. Pierre has alwas taken a large quantity of these goods. Most of the trading between New York exporters and St. Pierre was by means of direct orders.

CHAPTER VII.

NARRATIVES OF PERSONAL EXPERIENCES.—TOURIST PORTRAYS MONT PELEE.—STORMY HISTORY OF MARTINIQUE.—GRAPHIC LETTER FROM A CONSUL'S WIFE.—GREAT DISASTERS FROM VOLCANIC ERUPTIONS.—SCENES IN THE STRICKEN ISLANDS.

ADDITIONAL horror is excited by every account furnished of the volcanic explosions, as will be seen from the following story of a correspondent's personal experiences:

"Cable communication between the islands south of St. Lucia is interrupted, and the crater of Morne Soufriere, Island of St. Vincent, is in eruption. This could be seen from St. Lucia, twenty-one miles away, and in fact the flames were visible for forty miles. The government chartered the steamer Wear to go over and report. It left here at 6 o'clock on the evening of the 8th, just after the Roddam had returned from St. Pierre, Martinique.

"Terrible flames were visible during the entire journey. At midnight it was seen that a volcano was in eruption apparently about four miles away. The Wear ran into heavy showers of gray ashes and the people on board were almost suffocated.

"The atmosphere was so dense that we could see nothing. The steamer put about and steamed to the south for two hours before it was clear of the showers of ashes. At 3 o'clock in the morning the steamer put back towards the island and encountered more ashes, and was again compelled to put off. It arrived in Kingstown, the capital of St. Vincent, at about 5 o'clock in the morning.

"It was seen then that the volcano was in constant eruption, and there was a tremendous roar. Forked lightning played incessantly over the disturbed section. The flashes averaged from sixty to a hundred a minute. Kingstown, which is twelve miles from the volcano, was covered with three inches of ashes and showers of stones on Thursday. The bed of the old volcano was then a lake three miles across. The eruption was first observed

on Monday. Huge volumes of water shot up, and the people in that district fled. There has been a continuous roar ever since.

"The northern district from Chateau Belair to Georgetown has been completely destroyed. It is impossible to proceed beyond that point on account of the rivers of lava. A huge hill was observed where previously there had been a valley. The whole of that part of the island is smoking. Sixty persons are said to have been killed by lightning while getting away.

ISLAND OF ST. VINCENT, SHOWING TOWNS AND VOLCANO OF MT. SOUFRIERE.

"On Tuesday and Wednesday the island was showered with ashes. Near Belair the ashes were three feet deep. On Thursday there was a continuous shower of hot sand and water. Everything on the island was ruined by the ashes. Many persons were brought in boats from Kingstown. Some of the refugees who arrived on the coast were dying of thirst. Some of these people had been thirty-six hours without a drop of water. All the cattle were dead because of the lack of water. There is little food in the coast villages.

"On account of the scarcity of water and transport it is

impossible at present to go into the interior and investigate the extent of the disaster. It is impossible to say just how many people have perished, but the number will probably run into the hundreds. We left Kingstown at 8 o'clock in the morning with orders to tow a relief boat from Belair to Owia Carib. A quarter point off Barroulie we received a message from shore by boats that the passage was impassable. Nevertheless we proceeded on our voyage.

RIVERS OF MOLTEN LAVA.

"When opposite Belair there was a grand view of the west side of the crater. Rivers of lava were coming down the mountain sides in every direction and flowing into the sea. The huge crater was covered with smoke and there was an incessant eruption. Great quantities of ashes were blown in the air and were falling toward the sea, thus obscuring everything. A new lane was observed running out toward the sea for a half mile. It was probably lava which had been cooled by the sea water. It was of a brownish color. It was impossible to get close to the town. The sea was littered with trees and other wreckage. We attempted to proceed to St. Lucia through the falling muck of ashes, but found it impossible. It meant suffocation to try it. We returned and entered the belt again miles out at sea, but there was the same result. On the horizon there was nothing to be seen but falling ashes and other muck which were piled up like an enormous wall. Inside the belt all was dark.

"We put back and steamed round the island to the windward. Opposite Georgetown we encountered a gale of wind carrying smoke and debris. To the north the entire territory of the disturbed district was clearly visible. Besides the large crater numerous small craters were in eruption. Many rivers of lava were flowing seaward, one of them half a mile wide. When we were close to Georgetown we passed to the windward along the coast toward St. Lucia, and saw no sign of life. It is believed that every person within the disturbed area perished. The refugees at Georgetown and Belair are in danger."

The relative position of the sun and moon at an angle of

forty-five degrees was said by Hugh Clements, the scientist, to have been the cause of the Mont Pelée eruption on the island of Martinique. Mr. Clements said that this relative position of the sun and the earth's satellite occurred at exactly ten minutes to 8 o'clock on Thursday, May 8, the time when the eruption began.

The immense force exerted on the earth by the tangential position of the two bodies acted fully upon Mont Pelée and its molten contents. Its force was great enough to cause the blowing up of the volcano's cap. The Galveston disaster, he points out, occurred when the sun and moon were in a similar position to each other.

ERUPTION AS SEEN FROM THE NORTH.

Monsieur Albert, proprietor of the Lagarraue estate, which is situated 1700 yards northeast of the crater of Pelée, arrived at Port of Spain, Trinidad, on the steamship Canada. In an interview he gave a graphic description of the eruption that overwhelmed St. Pierre and destroyed its inhabitants.

About 8 o'clock on the morning of May 8 he was in a field on his estate, when he heard a most extraordinary noise—more extraordinary than those heard for several weeks past. It seemed like a hurricane coming toward him. Just previously the air had been very calm, although the sun was obscured by ashes and smoke. At the same moment that he heard the sound he felt a tremendous vortex of air, which he likened to an express train whirling past a station.

Immediately he saw trees in a space 100 yards long and fifteen wide hurled to the ground by the unseen force. Then he saw a huge black cloud high in the air traveling rapidly toward St. Pierre. Lagarraue is twelve miles from the city. As the cloud traveled, he heard numerous explosions, as if whole fleets of warships were firing a tremendous bombardment. A spur of the hill prevented him seeing what happened at St. Pierre.

He ran to the house for his family; thence he rushed to the seashore, where he boarded a small steamer, and was landed safely at Fort-de-France.

A detachment of troops, he reported, on Saturday, May 10th,

went to St. Pierre and opened the bank vaults. They found bank notes and books uninjured. The soldiers said about 500 corpses were exposed to view, but they estimated between 30,000 and 40,000 were buried in the ruins. M. Albert believed the cloud to have been a species of fire damp, fully a half mile wide. The large number of male whites that were killed is accounted for by the fact that when the volcano showed signs of activity numbers of the residents of St. Pierre sent there wives and families to Fort-de-France, remaing themselves to attend to their business occupations.

LETTER TELLS OF ERUPTIONS.

Thomas T. Prentis, United States Consul at St. Pierre, with his family, lived at Melrose, Mass., for six years. Their friends and relatives were distressed by the probable fate of Mr. Prentis, his wife, and two daughters, Misses Louise Lydia and Christine Hazel. Two adult sons, James A. and Thomas, were not with their parents. Miss Alice M. Frye, a sister of Mrs. Prentis, was in Melrose. She intended to go to St. Pierre a month ago, but deferred her visit. She received this letter from the Consul's wife:

"My dear sister: This morning the whole population of the city is on the alert and every eye is directed toward Mount Pelée, an extinct volcano. Everybody is afraid that the volcano has taken it into its heart to burst forth and destroy the whole island.

"For several days the mountain has been bursting forth and immense quantities of lava are flowing down the sides of the mountain. All the inhabitants are going up to see it. There is not a horse to be had on the island; those belonging to the natives are kept in readiness to leave at a moment's notice. Last Wednesday, which was April 23, I was in my room with little Christine and we heard three distinct shocks.

"The first report was quite loud, but the second and third were so great that dishes were thrown from the shelves and the house was completely rocked. We can see Mont Pelée from the rear windows of our house, and although it is fully four miles away we can hear the roar and see the fire and lava issuing from it with terrific force.

"The city is covered with ashes and clouds of smoke have been over our heads for the last five days. The smell of sulphur is so strong that horses on the street stop, snort, and some of them are obliged to give up, drop in their harness, and die from the suffocation. Many of the people are obliged to wear wet handkerchiefs over their faces to protect them from the strong fumes of sulphur. My husband assures me that there is no immediate danger, and when there is the least particle of danger we will leave the place.

"There is an American schooner, the R. J. Morse, in the harbor, and will remain here for at least two weeks. If the volcano becomes bad we shall embark at once and go out to sea."

SON OF CONSUL GENERAL AT ST. PIERRE.

The sequel appears in the following statement in a Chicago journal:

"James E. Prentis, 517 Forty-fourth street, son of Thomas T. Prentis, United States Consul at St. Pierre, Martinique, fears that his father, mother and two sisters perished in the disaster which overwhelmed the city May 8. When Mr. Prentis was informed of the destruction of St. Pierre he was in his apartment reading a letter from his mother written under date of April 23. In this no mention was made of any volcanic disturbances in the neighborhood of the city.

"The letter stated, however, that the Consul and his family had just moved into a frame residence in the heart of the city, where they would be most liable to danger from the eruption. Mr. Prentis feels that if there had been even an hour's warning of danger his mother and father would have left the city at once. Until a reporter called on him he had heard nothing of the catastrophe at St. Pierre.

"'Mother writes me under date of April 23d that they have just moved into a new residence, a large frame house, the very worst kind to resist the burning lava,' said Mr. Prentis. 'Their residence is situated in the centre of the city. The cable dispatcher there, who is also in charge of the local observatory, is a close friend of our family and always informs them of any change in

atmospheric conditions. He must have been able to know something of the impending disaster in time to warn them.

"'I have never been in Martinique,' continued Mr. Prentis, 'but I judge from what my family has written since going there that flight would not be easy from St. Pierre because of the mountainous surroundings. The only way to escape would really be to leave the island, and as I understand boats sail frequently, I trust that they got safely away'

"As late as April 23d no fear was felt in St. Pierre, for this letter says nothing of the matter. The mountain could not have been threatening them."

There are four children in the Prentis family. Two daughters —May, aged 22 years, and Christine, aged 15 years—were with their parents in Martinique at the time of the disaster. One son —Thomas—is at Batavia, Java, as representative there of the Standard Oil Company. The other son is James E. Prentis. The latter came to Chicago from the East in March, 1901, soon after his family had sailed for St. Pierre. Until April he was with the Dominion Steamship Company.

All the children were born in the Island of Mauritius and were educated there in a school conducted as a preparatory school for Oxford University. The son in Chicago spent most of his 'teens in Europe, and came to the United States with his family when Consul Campbell relieved Consul Prentis at Mauritius.

PROSTRATED BY THE NEWS.

Mme. Louise Louit, a teacher of French in Stockton, Cal., was prostrated over the news of the terrible disaster at St. Pierre, Martinique, as her sister and family resided in that city. On learning of the volcanic eruptions she swooned and was afterward in a serious condition. Her sister, Mme. Gentile, and the latter's husband, two sons, George and Raoul, and two daughters, Alice and Anias, are believed to have been killed, as she said they lived in a part of the city where they would be exposed to the molten lava which flowed down the mountain side. Raoul Gentile was rated as one of the most brilliant lawyers and orators on the

island, and held many prominent positions of trust. For two years he had been one of the representatives from the island in the French Chamber of Deputies.

E. S. Stone, of the Thomas E. Cook & Son Tourist Agency, was in St. Pierre in January, and recalled the threatening position of Mont Pelée, towering 4,200 feet high back of the city and surrounded on both sides by smaller peaks.

"The eruption," said Mr. Stone, "came undoubtedly from the crater of Mont Pelée. The mountains rise in a vast amphitheatre behind the city and extend in a magnificent sweep from Point Carbet on the south to La Mare on the north. The position of Mont Pelée, I should think, would enable it to bury St. Pierre under ashes from one end to the other. While I was there I saw no signs of activity in any of the volcanic mountains. They looked peaceful and quiet, and there was no smoke to be seen coming from any of them.

BUILT ON SLOPE OF HILLS.

"The city was built on the slope of the hills and the streets rose back from the bay in terraces. The mountains are cleft in the middle by the valley of the Riviere Roxelane, whose waters rush down the steeps, flow across a savanna, through the gutters of the city into the bay, thus giving the place a thorough system of sewerage. It was a beautiful city. The foothills were covered with bamboo and palms, and three miles from the town were botanical gardens, which for beauty excelled anything I have seen. There was an appearance of great prosperity in St. Pierre. The creoles and negro women dressed picturesquely and were very neat. Most of the population was negro, of course, but there were several French importing houses with headquarters there, besides English and French banks. The sugar plantations and factories are behind the town.

"The city is built close to the bay and is separated from it by a wide beach. There is practically no harbor, but the roadstead affords good anchorage for vessels. If there were any ships in the bay at the time of the eruption they must have been destroyed."

For suddenness, completeness and number of victims the destruction of St. Pierre, Martinique, appears to surpass nearly all disasters recorded by history. To find its equal we have to go back to the great earthquake which, on November 1, 1755, in eight minutes killed some 50,000 people in Lisbon, and was felt from Mitylene on the east to Madeira on the west, and from Fez on the south to Scotland on the north.

That, however, was an earthquake proper—a violent shaking of the globe's fabric—and not a sudden descent of burning earth and rock. What actually happened at St. Pierre is stated clearly in a brief despatch from the commander of the French cruiser Suchet to the Minister of Marine in Paris. This says:

"St. Pierre has been completely destroyed by an immense mass of fire which fell on the town about 8 o'clock Thursday morning. The entire population (25,000) is supposed to have perished. I have brought here (Fort-de-France) the few survivors —about thirty. All shipping in the harbor destroyed. The eruption continues."

QUIET MORE THAN FIFTY YEARS.

For several days Mont Pelée, the volcano just north of St. Pierre, which had been quiet since 1851, had been giving signs of renewed activity. Its eruption in 1851, however, while covering several hundred acres with debris, had caused no great loss of life. Earthquakes in 1839 and in 1767 had found 700 and 1,600 victims respectively in Martinique, but the latest of these had been worse at Fort-de-France than at St. Pierre.

Hence it is reasonable to suppose that the people of St. Pierre regarded the grumblings of Mont Pelée much as the people of Pompeii and Herculaneum probably did those of Vesuvius, and as the people of Torre del Greco are known to have looked upon the same volcano's activity in 1794. That is, they were regarded as dangerous, but not immediately or certainly destructive. Otherwise we should hear of fugitives reaching other parts of Martinique.

Mont Pelée seems to have done, however, what Krakatoa did

in August, 1883, and even more suddenly. Krakatoa's volcano literally blew its own head off, completely destroyed that island, and altered the appearance of the Strait of Sunda. Hundreds of people were killed by the falling debris, and the resulting tidal waves drowned more than 25,000 at Batavia alone. Such enormous masses of dust were thrown into the upper air that for months afterward they produced the strange phenomenon of the "red sunsets" which excited much wonder all over the world.

In the amount of material ejected the explosion of Mont Pelée seems to have been inferior to that of Krakatoa, but the populous town at the former's foot was literally annihilated. It may be that future explorers will delve in the ruins of St. Pierre as they do now in those of Pompeii and Herculaneum. But whereas there is reason to believe that the greater part of the inhabitants of the buried Italian cities escaped immediate death, from St. Pierre very few have survived to tell the tale. The fate of the victims descended as suddenly upon them from the sky as it came from the trembling earth at Lisbon.

PHENOMENA OF THE ERUPTIONS.

Although some light has been thrown on the character of the terrible eruption of Mont Pelée, by which the city of St. Pierre was blotted out of existence, the exact nature of the outbreak is a matter of speculation. Few eye-witnesses of the disaster, who were on land at the time of its occurrence have been found alive, and the stories they tell are far from being consistent and circumstantial.

It would seem, however, that no molten lava reached the ill-fated town, which was destroyed by a tremendous shower of huge fragments of hot stones, boiling mud and volcanic ashes and dust, while instant death came to all who were in the path of the flood of stifling and poisonous gases which accompanied these more palpable messengers of ruin. The most remarkable feature of the eruption that was reported was the sheet of flame which is said to have poured over the city hugging the earth, apparently, and setting fire to everything within its reach.

The manner in which the vomitings of the volcano were deflected in the direction of St. Pierre presents one of the most difficult problems connected with the eruption which scientific experts will be called upon to explain. It has been said that Mont Pelée blew her head off, but it is probable that the explosion, as distinguished from a mere eruption, was even more extended than that, and that the whole upper mass of the mountain was torn to splinters and scattered outward, as well as upward, in all directions.

A similar phenomenon was witnessed in 1812, when the destructive outbreak of the Soufriere of St. Vincent occurred, materially changing the geographical outlines of the island in its vicinity. On that occasion there was not a flow of lava from the old crater of the volcano, but a sudden explosion which tore out the side of the mountain and hurled the fragments with desolating force in a direction close to the earth.

VOLCANIC DUST SHOT UPWARD.

On the occasion just referred to there was another phenomenon which has again been witnessed during the outbreak of the St. Vincent Soufriere. An enormous volume of volcanic dust was shot high into the air—it attained a height, it has been estimated, of fully 16,000 feet—where it was taken up by the counter currents, and wafted across more than a hundred miles of water, in a direction directly contrary to that of the prevailing trade winds, and then deposited, in the shape of an impalpable powder, as dark and fine as lampblack, on the Island of Barbados and the surrounding sea. The same phenomenon was noted during the late explosions, when a great shower of volcanic dust made its way eastward from the crater of the Soufriere to the island standing isolated far out at sea, although the trade winds were blowing steadily all the while towards the southwest.

For two years the scientific corps of the Weather Bureau at Washington has been engaged in studying the direction and force of these upper air currents, and the phenomena connected with the eruptions of Mt. Pelée and the St. Vincent Soufriere will

materially assist them in arriving at sound conclusions. Experienced geologists and meteorologists accompanied the gunboat Dixie on the relief expedition to Martinique for the purpose of studying these and the other phenomena of the eruptions, on the ground, and valuable scientific results must follow.

There has rarely been witnessed in the experience of human beings so awful a scene of destruction as that volcanic upheaval at St. Pierre. The accounts of the cataclysm in which twenty-five thousand men, women and children were in a few minutes overwhelmed by the thick showers of molten fire that belched out of the earth may well make the proudest man feel how tiny and insignificant he is, and indeed all the rest of humanity, too, in the face of one of Nature's mighty and mysterious throes.

RIVAL TO THE INFERNAL REGIONS.

Many poets have set their imaginations to play in picturing hell. Milton was the greatest of them. But the infernal region and all its flaming terrors as he conceived them were not more hideous and appalling than the story of the experience of those hapless inhabitants upon whom the exploded mountain poured down its flaming and consuming storm. The fact is that the Day of Judgment, as foretold in the prophetic visions of the pious, could hardly impress the human mind with more horror than the extinction, as in a moment, of the West Indian town by the blast and whirlwind of infernal forces. It is one of the most impressive events of the age. It is a holocaust that makes civilization after all, seem very frail and feeble, and completely dwarfs the sense of importance which fills men concerning their relation to the universe. There is nothing like a contemplation of your earthquake or your volcano for knocking conceit and vanity out of the human heart.

Take for example, the following despatch, dated Fort-de-France, May 13th :

"This city is already filled with thousands of refugees from the north end of the island and more are constantly coming in. The terror has now taken a new form. There is imminent

danger of starvation before help can get here. The victims of the awful disaster who have escaped with their lives and even without injury are dazed and helpless as children. They are absolutely destitute of everything save the few garments on their backs.

"The food supply is so small that with the utmost caution it cannot last long among those who are here already, to say nothing of those who are still to come. From all points stragglers are making their way here. All the relief expeditions that are constantly going out bring here all whom they rescue.

A VILLAGE THAT ESCAPED DESTRUCTION.

"The French cruiser Suchet has already landed here practically all the inhabitants of Le Precheur, the village of nearly 4,000 inhabitants near St. Pierre which escaped destruction. In addition to these there are those at Morne Rouge, something like six hundred in all. All the district for miles about St. Pierre is a desolate waste. Even the whole appearance of the country has been transformed. Where there were hills there are now deep crevasses, and where there were cultivated valleys there are hills.

"It is not believed that there are any persons left alive in the northern part of the island. Those who have not perished have fled either to this place or elsewhere along the south coast. How many were lost in endeavors to escape in small boats to other islands will never be known. All that is certain is that many did take to the water in this way and of these but very few have been heard from. There has been a heavy sea running, in which a small boat could live only by a miracle.

"Over St. Pierre and all the country for miles around there is still, even in the middle of the day, a darkness from the great black canopy of smoke that continues to rise from Mont Pelée and spread out over the sky to the horizon. At considerable distances from where the big soufriere of the volcano was new craters have broken out.

"To add to the devastation, the rivers which took their rise from the vicinity of Pelée have overflowed their banks on the north

side of the island, and wide areas of country are under water. The work of exploring the ruins of St. Pierre is carried on with the utmost difficulty. There is a constant shower of cinders and ashes from the mountain. In addition there is the sickening odor that arises from the great heaps of dead which lie exposed in all directions or are mingled with the heaps of ruins."

Percy F. Marks, an English tourist, arrived in New York May 9th, and received his first knowledge of the disaster at Martinique. He was all over the island three weeks before. He spent several days in St. Pierre, studying the people, the customs and conditions of trade.

"It is interesting to study the comparative times of the eruption of Vesuvius with the three volcanic disasters at Java, Honolulu and Martinique." he said.

"We find that Vesuvius has in each instance indicated serious trouble. The old mountain seems to be a sort of stormy petrel, to tell when there was to be disasters in other parts of the world. I don't attempt to assign a scientific reason for this, but I cite it as a fact that Vesuvius grows restless just before something dreadful happens in another part of the world.

PEOPLE COULD FIND SHELTER.

"I am inclined to believe that the deaths among the people of St. Pierre have been exaggerated. The island of Martinique is cut up with many deep ravines, and there are steep mountain sides with sheltered spots where hundreds of people could, and I think we will learn, did find shelter. This condition existed in the case of the terrific hurricane of a number of years ago in the British West Indies. The first reports said that thousands of people had been killed, but gradually, after the excitement wore off, hundreds and hundreds emerged from hiding places which were not known to exist.

"I really believe that we will learn in a few days that there are sheltered spots on the island of Martinique in which hundreds of terrified people are now hiding. But I am not so sure we have heard the worst from St. Vincent. This island is thickly popu-

lated, especially in and around Kingstown, at the foot of the volcano La Soufriere.

"The people of Martinique are very poor, although outwardly their houses and shops give an impression of wealth. Their buildings are very pretty, are in colors, red, white and blue, and are kept up very well. Inside the shops the displays appear to be quite lavish, but there are few moneyed purchasers. The credit system prevails almost exclusively. The majority of the people, who are black, of course, live on next to nothing. Four pence (eight cents) a day is the usual wage for labor, and is about as much as the employers can afford to pay. The laborers work very hard for the small wages.

WOMEN OUTNUMBER MEN.

"As in most of the West Indian Islands the women greatly outnumber the men, and do the brunt of the manual labor. The sugar trade, which is practically the only industry of the Island of Martinique, has not been profitable of late years, and the future of both Martinique and Guadeloupe, even before the eruption of Mont Pelée, was very gloomy.

"The French government intends to remove the bounty from sugar, and without this bounty the industry cannot live, and without the industry the people of the island cannot very well subsist. But even with the best of conditions it will be many years before the Island of Martinique can be worked. Lava solidifies in about two years, the time required for its cooling. I think that it will be found to be from thirty to fifty feet deep in St. Pierre.

"There were a great many Americans in business in St. Pierre. The business of the island seemed to be about equally divided between French and American merchants. There were very few Englishmen on the island. The whites were practically all Americans and French. During the winter there are thousands of American tourists on the island. It is a delightful place to spend a few weeks; the climate is superb, and everything about the place is intended to charm the visitor. It is a fairyland in

miniature, really; I never have seen any spot more beautiful or more poetic.

"Oh, no; it will not mean the desertion of the island. In a few years St. Pierre will again be a flourishing city. The natives of the island are peculiarly phlegmatic and philosophical. They take whatever is sent to them and make the best of it. Of course, in a case of this kind, it comes pretty hard, but these strange people will sigh and sob for a few weeks. The few who survive will then calmly begin the reconstruction of the city. It will take many years, no doubt, but the survivors of St. Pierre will do just what I say they will. That is their nature. People will come from other parts of the island and abide with them and labor with them, and eventually we will see another fairy-like city nestling in the very shadow of the great mountain which sent death among them.

NEW CITY WILL ARISE

"The history of volcanic eruptions would assure the fulfillment of my prediction. Whenever there has been one a new city has arisen on the site of the one destroyed. The people reason, no doubt, that eruptions occur not oftener than one every fifty years, and that to live in peace for that length of time will be sufficient for them."

"Was there any alarm felt by the people of Martinique when you left there?" was asked of Mr. Marks. "Absolutely none. No one expected that the grand old Mont Pelée, the slumbering, so it was thought, tranquil old hill, would ever emit forth fire and death. It was unlooked for. Mont Pelée was regarded by the natives as a sort of protector; they had an almost superstitious affection for it. From the outskirts of the city it rose gradually, its sides grown thick with rich grass, and dotted here and there with spreading shrubbery and drooping trees. There was no pleasanter outing for an afternoon than a journey up the green, velvet-like sides of the towering mountain and a view of the quaint, picturesque city, slumbering at its base.

"There were no rocky cliffs, no crags, no protruding bowlders. The mountain was peace itself. It seemed to promise perpetual

protection. The poetic natives relied upon it to keep back storms from the land and frighten, with its stern brow, the tempests from the sea. They pointed to it with profoundest pride as one of the most beautiful mountains in the world.

NATIVES LIVE IN CONTENTMENT.

"Children played in its bowers and arbors; families picnicked there day after day during the balmy weather; hundreds of tourists ascended to the summit and looked with pleasure at the beautiful crystal lake which sparkled and glistened in the sunshine. Mount Pelée was the place of enjoyment of the people of St. Pierre.

"I wonder what the trustful, worshipful people thought when the great volcano began to frown upon them, when steam and fire began to rise from those beautiful grassy slopes. As near as I can ascertain the spurts of lava came from the sides, not the top. From the position of the volcano the torrents must have flowed straight into the city, sweeping through the nice districts first, and next blotting out the business districts. Had some one three weeks ago, when I was in St. Pierre, told the natives that Mount Pelée would soon open up and hurl death at them, he would have been laughed at. I can just hear the placid, forbearing natives say; 'Oh, no; old Pelée is our protector—not our destroyer.' But no one suggested it, because no one even suspected it."

What most impressed the stranger on his first arrival in St. Pierre was the brilliancy of the women's costumes. The streets were filled with an endless throng of graceful swaying figures, clad in audacious color contrasts. These gay toilets were almost exclusively confined to the negro or mulatto population. The wives and daughters of the French white planters adopted everywhere the modern fashions.

Until the fall of the French empire in 1870, when universal suffrage was granted alike to whites and blacks, the government was exclusively in the hands of the white aristocracy, between whom and their colored inferiors was drawn a strict line of demarcation. As the whites also nearly monopolized the wealth of the

island they were able to give their children an education in France, which still more emphasized the difference between the races.

Later, however, with wealth and power passing into the hands of the more enterprising among the colored population, they, too, had been giving their children the educational advantages formerly denied to themselves; not only were many of the young negroes and half-breeds educated abroad, but the schools and institutes established for their benefit in Martinique lessened the intellectual distance between the races. The social distance, on the contrary, was emphasized as the whites retired more and more within themselves. Hardly a man with the slightest drop of negro blood was admitted to the houses of the aristocracy, and even when political distinction raised him above the masses it secured no exception for his wife and daughters.

Martinique is famous in French history as the birthplace of of Mme. de Maintenon and Josephine, afterward Empress of the French. It was at Fort-de-France that Marie Rose Tacher de la Pagerie, a planter's daughter, rich in youth, beauty and hope, passed her schooldays. The momory of Martinique's Creole Empress is fittingly commemorated by a marble statue placed in the centre of a green savanna, encircled by nine towering palms. It was executed in Paris by Dubray and presented to the people of the island by Napoleon III.

EMPRESS JOSEPHINE'S BIRTHPLACE.

From a historic standpoint, the most interesting of all Martinique excursions, namely, to the old plantation homestead of Josephine, is made from Fort-de-France. After leaving the highway and traversing a valley for several miles, one comes upon the old La Pagerie estate, whers stands the famous little sugar house, the childhood home of Josephine. This, however, was not the original La Pagerie mansion. The latter stood on an elevation near by, and was a typical and luxurious home, quite in keeping with a wealthy planter of that period. It was completely destroyed in the great hurricane of 1776, a few years after Josephine's birth. M. La Pagerie then took up his residence in the only building left

on his estate, the old sugar house in the valley, whose thick walls and lower location had withstood the fury of the storm.

It was in this lowly and unpretentious abode the young Josephine passed the days of her infancy. When twelve years old she was placed in a convent school in Fort-de-France, where she remained until her sixteenth year.

Among the legendary spots pointed out is the well where an old fortune-telling negro woman made the famous prophecy that Josephine would one day become queen of France. Here she spent her youth until 1799, when she sailed for Paris and became the wife of Alexander Beauharnais. Ten years later, with Hortense, she visited her island home, which she was destined never to see again. The historic little home has been kept up as a sort of memorial by the island government.

The Island of Martinique has several times been devastated, either by volcanic eruptions, hurricanes or smallpox and yellow fever. Within the borders of the island there are five volcanoes, which are supposed to have been extinct. For many years until 1851 all the mountains had been quiet. One of the peaks has an enormous crater, exceeded by only three or four others in the world. In 1888 the island was visited by a sweeping epidemic of smallpox, which raged for the most part among the lowest classes, principally among the negroes. Each year the city has suffered from yellow fever, although the City of St. Pierre has an excellent natural drainage.

HAS BEEN LEVELED BEFORE.

Fort-de-France has been leveled three times by earthquakes and once by a hurricane. Most of the cosmic disturbances in Martinique, however, take the form of earthquakes, and these are so common that the inhabitants pay little attention to any but the most severe. The earthquakes seem to originate beneath and in the immediate vicinity of Mont Pelée, and are judged to be probably due to the subsidence of the strata beneath that giant dome. The Island of Martinique is one of the most densely settled regions on the globe, having 187,692 people, all of whom,

in one way or another, get their living from the soil, for Martinique has no mines and none but the simple manufactures that might be expected of a people whose time is given up to agriculture.

During the great wars of the last century between England and France, it was four times taken by the English, being seized in 1762, 1781, 1794 and 1809, and finally restored by the treaty of 1814, only after the most urgent representations on the part of the French that not for commercial or military purposes, but solely for a sentimental consideration, the island should be returned; that the French people desired above all things to own the little island that had given them their beloved empress.

England yielded the point with diplomatic courtesy, and since 1814 the tricolor has floated over Martinique. It is too far from France to be a show place for the French. Like St. Helena, it is far from the beaten routes of tourist travel; like Elba and the lonely rock on which Napoleon Bonaparte died, it would not be known at all save from the fact of having been made famous by a historic character.

RECALLS DESTRUCTION OF POMPEII.

The destruction of Pompeii and Herculaneum by the eruption of Mount Vesuvius, as described by Sir Edward Bulwer-Lytton in "The Last Days of Pompeii," is given renewed interest by the disaster at St. Pierre, to which it bears many points of similarity. The author's words are as follows:

"The cloud which had scattered so deep a murkiness over the day had now settled into a solid and impenetrable mass. It resembled less even the thickest gloom of night in the open air than the close and blind darkness of some narrow room. But in proportion as the blackness gathered did the lightnings around Vesuvius increase in the vivid and searching glare.

"Nor was their horrible beauty confined to the usual flashes of fire; no rainbow ever rivaled their varying and prodigal dyes; now brightly blue as the most azure depth of a southern sky; now a lurid and snake like green, darting restlessly to and fro as the folds

of an enormous serpent; now of a lurid and intolerable crimson, gushing forth through the columns of smoke far and wide, and lighting up the whole city from arch to arch, then suddenly dying into a sickly paleness, like the ghost of their own life.

RUMBLINGS OF EARTH.

"In the pauses of the showers Gan heard the rumbling of the earth beneath and the roaring waves of the tortured sea, the grinding and hissing murmurs of the escaping gases through the chasms of the distant mountain. Sometimes the cloud appeared to break from its solid mass, and, by the lightning, to assume quaint and vast mimicries of human or of monster shape, striding across the gloom, hurtling one upon the other, and vanishing swiftly into the abyss of shade, so that, to the eyes and fancies of the affrighted wanderers, the unsubstantial vapors were as the bodily forms of gigantic foes—the agents of terror and of death.

"The ashes in many places were already knee deep, and the boiling showers which came from the steaming breath of the volcano forced their way into the houses, bearing with them a strong and suffocating vapor. Immense fragments of rock, hurled upon the house roofs, bore along the streets masses of confined ruin.

"The winds and showers came to a sudden pause; the atmosphere was profoundly stale; the mountain seemed at rest, gathering, perhaps, fresh fury for its next burst. * * * Suddenly as he spoke the place became lighted with an intense and lurid glow. Bright and gigantic through the darkness which closed around it, like the walls of hell, the mountain shone—a pile of fire. The summit seemed driven in two, or above the surface there seemed to rise two monster shapes, each confronting each, as demons contending for a world. These were of one deep blood-red hue of fire, which lighted up the whole atmosphere, far and wide, but below the nether part of the mountain was still dark and shrouded, save in three places, adown which flamed serpentine and irregular rivers of the molten lava.

"Darkly red through the profound gloom of their banks they flowed slowly on as toward the devoted city. Over the broadest

there seemed to spring a cragged and stupendous arch, from which, as from the jaws of hell, gushed the source of sudden disasters, and through the stilled air was heard the rattling of the fragments of rock, hurtling one upon another as they were borne down the fiery cataracts—darkening for one instant the spot where they fell, and suffused the next in the burnished hues of the flood along which they floated.

AVALANCHE OF FIRE.

"Glaucus turned in gratitude and caught Ion once more in his arms and fled along the street, that was yet intensely luminous. But suddenly a duller shade fell over the air. Instinctively he turned to the mountain, and, behold! one of the two gigantic crests into which the summit had been divided rocked and wavered to and fro and then with a sound, the mightiness of which no language can describe, it fell from its burning base and rushed, an avalanche of fire, down the side of the mountain.

"At the same instant gushed forth a volume of blackest smoke, rolling on over air, sea and earth. Another, and another, and another shower of ashes, far more profuse than before, scattered fresh desolation along the streets. Darkness once more wrapped them as a veil.

"The sudden illumination, the bursts of the floods of lava and the earthquake, which we have already described, chanced when Sallust and his party had just gained the direct path leading from the city to the port, and here they were arrested by an immense throng —more than half the population of the city. The sea had retired far from shore and they who had fled to it had been so terrified by the agitation and preternatural shrinking of the element, the gasping forms of the uncouth sea, which the waves had left upon the sand, and by the sound of the hugh stones cast from the mountain into the deep, that they had returned again to the land, as presenting the less frightful aspect of the two."

A leading journal thus comments on the harrowing calamity:

"The appalling character of the disaster which has visited the island of Martinique is fully confirmed by the details of the

calamity as they slowly come to hand; the eruption of Mont Pelée will pass into history as one of the most terrible and destructive on record. The conditions existing in the district immediately back of St. Pierre are as yet unknown, and thousands of refugees may have found safety there, although they may now be suffering great privations.

"No account of the eruption by intelligent and reliable eye-witnesses on land has as yet been received, and when such a narrative is available, it may materially modify the first impressions. It would appear, from a letter written by the wife of the American Consul at St. Pierre, that the inhabitants of the fated city had had fully two weeks' warning of the doom that threatened them, and it would be a singular illustration of the charcteristic enervation resulting from tropical influences if the repeated warnings were ignored by the entire population of the city.

ENTITLED TO SYMPATHY.

"At the best that can be hoped for, however, the havoc wrought by Mont Pelée is so extended and far-reaching in its effects, that the islanders are entitled to the substantial exhibition of sympathy which promises to reach them from every quarter of the civilized world. The industrial conditions prevailing in Martinique before this terrible visitation presented, in the main, a happy contrast to those existing in the British Islands by which this prosperous French possession is surrounded. The British West Indies have been afflicted with a sort of industrial dry-rot which has been slowly but surely destroying their vitality ever since the decline of sugar-planting consequent upon the abolition of negro slavery. In Martinique, and Gaudeloupe as well, there have been no such radical changes in the industrial situation, and both these islands have retained almost the full measure of their original prosperity.

"Although the white population of Martinique is only six per cent. of the total—barely 10,000 in about 175,000—it is large in comparison with that of any and all of the British Islands, and the natives of various shades of color are far from being as thriftless and as shiftless as the blacks of the last-named dependencies.

They have the gay and frivolous temperament of the South of France, but it is coupled with a fair measure of the substantial qualities of the French peasant, and they are industrious and frugal in a degree that is encountered in none of the British possessions.

"The terrible calamity which has visited this beautiful island has swept tens of thousands of its inhabitants to a sudden and horrible death, the white element of the population probably suffering more than the colored in proportion, because they were naturally attracted to a residence in the fatal city of St. Pierre, while the survivors living in the devastated region, whether they are many or few, have been utterly ruined as to their worldly belongings. The lavish hand of tropical nature will soon cover the waste places with the luxuriant growth which already hides the ravages of previous cataclysms, but many years will elapse before the island will witness the return of the prosperous and contented conditions so lately existing."

CHAPTER VIII.

ST. VINCENT VOLCANO IN ACTIVE ERUPTION.—TERRIFIC CANNONADE HEARD ONE HUNDRED MILES AWAY.—KINGSTOWN SHOWERED WITH HOT ASHES AND PEBBLES.

ON Thursday, May 15, one week after the eruption of Mt. Pelée, despatches were received confirming the reports that a large part of the population of St. Vincent, Martinique's neighbor, had been destroyed. Governor Llewelyn, of the Windward Islands, sent the following despatch to the Colonial Office at London :

"I arrived at St. Vincent yesterday and found the state of affairs worse than was given in the reports forwarded by the Administrator.

"The country on the coast between Robin Rock and Georgetown (a stretch of about three miles on the coast) was apparently struck and devastated in a similar manner to St. Pierre. I fear that all living things within that radius have been destroyed. Probably sixteen hundred persons have been killed. The number will never be exactly known.

"The managers and owners of estates, with their families and several of the better class of people, were killed. One thousand bodies were found and buried. One hundred and sixty persons were sent to the hospital at Georgetown. Probably six of this number will recover. The details are too harrowing to describe.

"I have got a coasting steamer from St. Lucia going up and down the leeward coast with water and provisions. The sum of £2,200 has been received for relief of the distressed.

"I have asked the Governor of Trinidad to send a doctor, and have ordered another from Grenada. The British warship Indefatigable remains. All the neighboring British colonies are giving assistance generously.

"The extent of the awful calamity is now being realized and every effort is being made to grapple with it. All the beet sugar

estates in the Carib country have been devastated, and all the cattle are dead.

"The eruption continues, but is apparently moderating. Anxiety is still felt. The officers and residents are co-operating with me and the ladies are making clothing."

The Admiralty received the following cable despatch from the commander of the British warship Indefatigable, last night, dated St. Vincent:

"The eruption is apparently moderating. The northern end is devastated from Belair round to Georgetown. On the windward side, matters are worse. The mortality is about 1,600. About 3,000 are under relief. I can render necessary assistance from St. Vincent."

THANKS FOR CHAMBER OF COMMERCE.

The Consul General of France at the port of New York made this public announcement:

"I received from the French Government a cablegram directing me to thank the Chamber of Commerce and the people of New York for their great outburst of sympathy and generosity. This is only the informal thanks which I am to convey at once. I have no doubt the Government will formally express its appreciation later. It is easy to understand that the Colonial Minister is very much overwhelmed with business just now.

"For my own part, I wish to say that this great, generous demonstration is touching in the extreme. There is not another country in the world from which it could have come except America—it is like the American people. I repeat that it touches me deeply. I am constantly getting contributions and generous checks. The difference between such spontaneous liberality and having to pass around the contribution plate is very great, I assure you. To a man in my position here it is a relief that is quite beyond expression."

The auxiliary cruiser Dixie sailed from Brooklyn for Martinique Wednesday the 14th, having on board 1234 tons of food and clothing, a number of officers of the Quartermaster's and

Commissary's Departments to distribute it, and a number of passengers. All but 700 tons of her cargo was put on in one day.

The following statement was made on this day, showing the plans laid for the trip of the Dixie :

"The army officers who went on the Dixie to attend to the distribution of the relief supplies were Captain R. Sewell, Captain Hugh J. Gallagher, Assistant Surgeons J. B. Clayton, J. R. Church and I. Riley, Captain W. S. Ross, four sergeants and four privates of the Hospital Corps.

"Among the passengers to sail were Dr. Jagger, the Harvard geologist; Prof. Hill, of the United States Geological Survey; Prof. Russell, of the University of Michigan; Captain Borschgrevink, the Antarctic explorer, and George Curtis, of the National Geographical Society.

OFF FOR MARTINIQUE.

"The Dixie is commanded by Captain R. M. Berry, and her navigating officer is Lieutenant John B. Bernadou, who commanded the Winslow during the Spanish War.

"Lieutenant Bernadou said that the cruiser would lay a course almost due south after leaving this port, going through the Anegada passage after leaving Hatteras. The entire journey of 1,800 miles, he thought, might be made in four or five days. The Dixie, he said, would be pushed for all she was worth, and he expected that she would average thirteen knots, very good speed for her, considering her foul condition.

"No arrangements for the distribution of the Dixie's supplies had been made when the cruiser left New York. She will go first to Fort-de-France, where the army officers will get a good grip on the situation, and then proceed to the point where help is most needed. It is likely that a great deal of the Dixie's cargo will be taken ashore at Fort-de-France."

By Wednesday, one week after the eruption, correspondents were able to reach the scene. One wrote as follows :

"Mont Pelée is still in a state of eruption, but the winds are

southerly and the smoke and the greater part of the heavier matter thrown out are borne away to the northward.

"This has somewhat relieved the working parties in St. Pierre, and has made a more careful examination of the ruins possible.

"I made a trip through the ruined city and through the adjacent villages with the searching party organized by Signor Paravicino, the Italian Consul at Barbados, whose daughter was visiting there and who perished in the disaster. The body was recovered and has been brought here in a coffin.

CURIOUS EFFECTS OF THE FIRE.

"There was some doubt at first concerning the identity of the remains, but this was set to rest by relatives and friends identifying the clothing. This was another example of the curious effects of the fire that swept over the town, bodies being burned beyond all recognition, but clothing of flimsy material being little damaged.

"The body was found by Signor Paravicino near the village of Carbet, a suburb of St. Pierre. The scenes around the residence where the girl had been visiting were worse than in St. Pierre itself. In the latter place the victims were mostly covered with ashes and other debris.

"Near Carbet I saw five hundred bodies that were terribly distended and in an advanced state of decomposition. These bodies were counted around the house in which Signora Paravicino was found and on the adjacent land.

"Nearly all the dead were lying on their faces on the ground. Those found in the ruins of dwellings were badly charred.

"The body of a woman was found in a nearby stream, to which she had apparently fled in the hope of saving herself from the fiery flood.

"A large heap of bodies was found in one spot. They were apparently those of servants.

"Another residence close by, but sheltered partly by a hill on the St. Pierre side, escaped almost untouched. The windows

and inside blinds are gone, but inside the furniture, papers, books, clothing and flooring are mostly unscathed.

"The only living thing seen in this district was an ox, thin as a skeleton. While the body of Signora Paravicino was being prepared for removal this animal stalked slowly through the wreckage to the beach, where it drank sea water and then went back up the hill side.

"I went on foot from Carbet to St. Pierre. On the road the remains of a man and horse were passed.

"Further on was seen the body of a man at the foot of a statue of the Virgin, he apparently having been killed while praying.

"A large statue of the Virgin on the hill above St. Pierre was hurled yards distant from its base."

The accompanying statement by a visitor at Martinique pictures vividly the ruin wrought by volcanic outbursts:

BAPTISM OF FIRE LASTING NINE DAYS.

"St. Vincent has passed through a veritable baptism of fire, and the results are only less terrible than those that followed the eruption of Mont Pelée, destroying the town of St. Pierre and its environs with their 30,000 to 40,000 inhabitants.

"Morne Soufriere has been in activity for nine days, and its victims are numbered by the thousands. A line drawn from Chateau Belaire to Georgetown would divide the island of St. Vincent into halves. There is probably no human being alive north of it. Already 1000 bodies have been recovered, and it is known that many hundreds lie buried under the ashes that are mantled over the island.

"It is conservatively estimated that 2000 have been sacrificed since the first eruption on May 7. This includes all of the Carib Indians, which means the practical extinction of the race that was found here by Columbus four centuries ago. An old Indian prophecy that the Caribs would be sacrificed to the fire god which they worshiped has thus been fulfilled. Of the Caribs only a few individuals remain on the islands of St. Lucia and Dominica.

"From St. Lucia the eruption of Morne Soufriere was visible during the night of May 7. The following night the steamship Wear, of the Royal Mail service, attempting to force her way to Kingstown, ran into a floating bank of ashes. For three hours the ship was practically helpless in a cloud of smoke and sulphurous gas denser than that which floated down from Mont Pelée.

"When Kingstown was finally reached at daybreak it was found panic stricken. The streets were covered two inches deep with ashes and stones that had fallen during the night. Kingstown is fifteen miles from the crater which ejected the stones, yet the rain of missiles was almost incessant for three days.

"From Chateau Belaire word came that the distress there was great. A call had been sent for a clergyman, and one was taken up by the Wear. Down the sides of Morne Soufriere were flowing hundreds of streams of lava, which, uniting and separating, formed a network from which there was no possible escape for any living thing caught within its grasp.

A SWIFT STREAM OF MOLTEN LAVA.

"By the explosion of 1812 a river that had existed ever since the discovery of the island was dried up. Down its channel there now flows a swift stream of molten lava, which glistens like liquid silver, and which flows into the sea within 100 yards of Georgetown. As the water and the lava meet, a great cloud of steam arises, and the hissing can be heard for miles.

"From a distance dozens of craters can be seen, now opening and again closing, near the crest of Morne Soufriere. The force of the eruption seems to be lessening, but the danger is still great. The most violent eruption stopped in the afternoon of May 10.

"Many searching parties are now out. Seven estates have been ruined beyond hope of repair. Two chapels have been buried under a stream of lava. Many houses have been covered under masses of ashes and lava, and there is hardly a spot in the island that is not under from two inches to ten feet of ashes.

"The British steamer Cennet on Sunday ran through five

miles of smoke that was so dense that the crew were almost suffocated. For more than an hour the ship had to be left to its own guidance.

"Morne Soufriere, though not so active as it was last week, is still so threatening as to terrify the inhabitants. Smoke and flames continue to belch from the crater, over which there is an incessant play of ligtning, forking out from the column, that reaches so far up into the sky that the eye cannot reach its crest.

"It was more than two weeks ago that Morne Soufriere first gave warning that it was about to give a display of fireworks more majestic than has been seen by man during the last thousand years. Soufriere raises its head 4048 feet above the sea level. It lies at the northern end of St. Vincent, and can be seen fully fifty miles at sea on a clear day. For ninety years the old volcano has been somnolent. On rare occasions it has grumbled internally, but it has been regarded as harmless by the Indians, who have told of the eruptions, which ceased long ago, and which they have carried in their traditions.

"After the eruption of 1812 the old crater closed, and water filling it, formed a beautiful blue lake.

HISTORY OF THE OUTBREAK.

"For many days Soufriere labored inwardly in a manner such as was new to the present generation. Then, on May 5, the crater lake became greatly disturbed. It began to boil and bubble like a great cauldron. Steam arose from it in immense clouds. The rumbling beneath the mountain redoubled in force, and at 2 o'clock that afternoon Soufriere trembled as though it was in the throes of a terrible agony. Then came a series of severe earthquakes that shook the entire island.

"That night sulphuric flames played about the summit of the volcano, giving it a weird and terrible appearance. Steam continued to rise in clouds, and the thunders of the skies were joined with those that came from the bowels of the Soufriere.

"All during Wednesday the splendid phenomenon continued, giving those who lived in the near vicinity of the volcano ample

time to make their escape. All seem to have been hypnotized, and of the thousands who were there only a few hundred went away.

"It was noon on Wednesday when Morne Soufriere suddenly opened, sending six separate streams of lava pouring and boiling down its sides. Death was everywhere, and in its most terrible forms. Lightning came from the sky, killing many who had escaped the molten streams that were pouring into the valleys.

"For this great tragedy the settings were wonderful. Soufriere literally rocked in its agony. From its summit a majestic column of smoke, inky black, reached skyward. The craters were vomiting incandescent matter that gave forth prismatic lights as it rolled away toward the sea.

"Great waves of fire seemed to hedge about the mountain top. Such thunder as has seldom been heard by man cracked and rolled through the heavens. From the earth came tremendous detonations. These joined with the thunder, all merging in an incessant roar that added to the panic of fleeing inhabitants.

A HUGE COLUMN OF SMOKE.

"This lasted through the night, and the day and night following. On Thursday morning a huge column, so black that it had the appearance of ebony, arose to an estimated height of eight miles from the top of the volcano.

"Ashes and rock, as well as lava, were carried skyward in this column to deluge the island and the ocean for miles around. Gradually the column mushroomed at the top, spread out into dense clouds, that descended to bring night at noontime.

"The atmosphere was so laden with sulphurous gas that life was made almost impossible. It is believed that many of those nearest to Soufriere were suffocated by this gas before they were touched by the burning lava.

"Many expected that the entire island would be destroyed, and the night of Thursday was given up to prayers. All that night the darkness was beyond description, save when everything was made light as broad day by the lightning which forked out from the volcano.

"The earth quaked incessantly, the mountains shook, stones, lava and great quantities of ashes never ceased to fall. So terrible were the thunders that it seemed to the terrified that the universe was being rent to pieces.

"Friday brought a slight respite. Soufriere became less agitated. The lava streams did not decrease, but the showers of rock stopped for a time. Then those of stout heart ventured out to take stock of the wonderful ruin that had been wrought.

"All areas of cultivation were found to be destroyed, buried under banks of volcanic matter. Wallibou and Richmond plantations and villages on the leeward coast were wrecked. Wallibou was partly under water, which had been swept in from the sea by a tidal wave. Five other plantations were gone.

"The Carib Indians had made that portion of the island lying at the base of Soufriere their country. That entire district was a smoking incinerated ruin. Ashes were everywhere, no place being less than two feet deep, and in some places lava had rolled over the deep banks of ashes. Every Indian had disappeared. If there is a survivor he is not yet known.

"All vegetation had disappeared. Not a sprig of green was to be seen on the island. Live stock had died. Houses had vanished. Rivers were dry and their beds ran lava.

"Everywhere north of Chateau Belaire were dead bodies, some half buried, others showing that they had been stricken down by the lightning. A few seemed to have been dipped in lava, which took form from them. Decomposition seemed to be almost immediate. The dead are being buried now as rapidly as possible, but the conditions are such that pestilence can hardly be avoided.

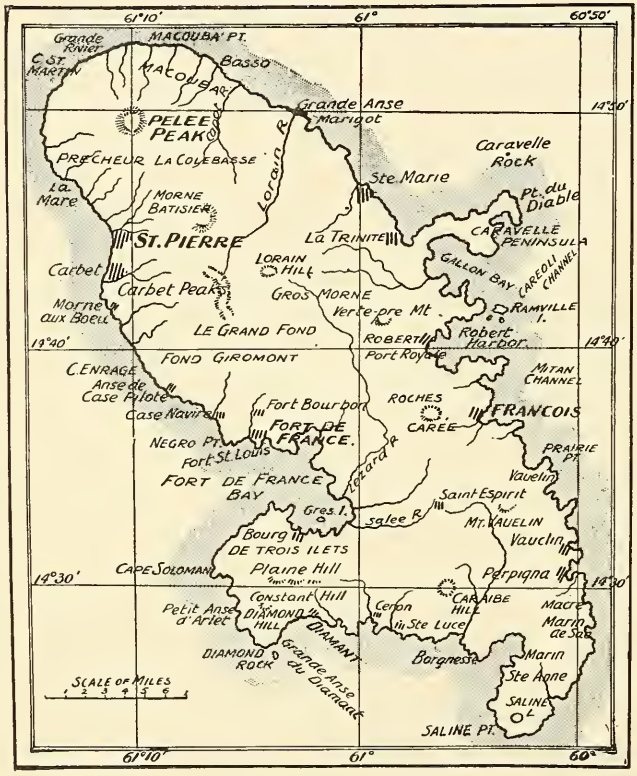
GEORGETOWN'S TERRIBLE PLIGHT.

"Kingstown is safe, but Georgetown has suffered terribly. In the hospitals there 167 sufferers are now being cared for, with little chance that any of them will recover. Now there is a famine. Unless supplies are quickly received, hundreds will starve. While the violent eruption has ceased, the air is still filled with volcanic dust and ashes, creating an intense thirst and

causing such suffering as can hardly be imagined by those not on the island.

"The Soufriere broke forth again on the 13th, but there remained no more inhabitants in the north of the island. Its explosions are said to have been heard for nearly one hundred miles through the Caribbean Sea.

"Work among the ruins of St. Pierre is being continued in an unsatisfactory manner. The soldiers have to be forced to act, and hour by hour the danger of an outbreak of pestilence increases. The dead are being burned, the pyres being fed with petroleum and tar. Great fires are kept going, which at night light up the entire island, and which, being seen at St. Lucia, led to the belief that Fort-de-France had burned. The fires in the city have burned themselves out, making it possible to dig down into the ruins, thus revealing the horrors that have been buried.



ISLAND OF MARTINIQUE, SHOWING MONT PELEE AND ALL THE TOWNS.

"In the streets ashes and cinders are in places six feet deep. Everywhere are the dead bodies, decomposing and giving off a stench that makes the workers faint. Although thousands have been burned, bodies still remain to be cremated. Many of the

bodies are carbonized and swollen. Some are encrusted with ashes. Under one ruin perhaps only a single body will be found, while not far off will be a group of half a score huddled together.

"In all St. Pierre only a single human being escaped the work of Mont Pelée. The one is a negro murderer, who was locked in a cell so far under ground that the gases, as well as the flames, failed to reach him. There he remained for four days before his cries were heard. When the cell door was thrown open he dashed away. He is believed to have been crazed by the awful experience through which he passed.

"Armed soldiers are watching the workers to prevent the robbing of the dead bodies or the ruins. Vandals continue to profit, but orders that have been given to shoot down any person who is seen robbing a body will probably put a stop to the crime. Some idea of the terrible heat poured down from Mont Pelée may be had when it is known that the iron rollers of the Prinelle sugar mills were melted as though they had passed through a furnace."

TERRIFIC CANNONADE.

Another account furnishes additional confirmation of the foregoing reports:

"The Soufriere volcano, on the island of St. Vincent, is still in destructive eruption. A terrific cannonade can be heard a hundred miles away. The reports are followed by columns of smoke, rising miles in the air. Immense balls of colored fire also issue from the crater. Lightning is playing fiercely in the upper sky, and the whole northern part of the island is one mass of traveling flame. It is impossible to reach the burning district by land or sea, and there are no means of estimating the destruction wrought to life and property.

"Kingstown, the capital of St. Vincent, is still safe, though showers of ashes and pebbles are continually falling on the town. The volcano itself is invisible. It has just been officially reported that there were 1600 dead up to May 12th, at St. Vincent.

"It is reported from the French island of Guadeloupe that pumice stone in great quantities is floating on the sea there and

at the British island of Dominica, and that much stone has been cast up on the beaches of these islands.

"The eruption of Mont Pelée continues, covering the island with ashes, which are in places many feet deep. The rumblings of the volcano are heard continuously. St. Pierre can now be approached. Troops and a man-of-war have been sent there to search the ruins and bury and burn the dead. The stench in the city is awful.

"The streams of fire that destroyed St. Pierre came from the side of the mountain, which opened and closed, leaving large and very deep crevices near Macouba and Grand Riviere. The sea during the catastrophe withdrew several hundred feet, coming back steaming with fury. The officers in charge of a boat making soundings off the island report a depth of 4000 feet, where formerly it was only 600 to the bottom. Pumice stone and ashes covered the sea for many miles.

"The cable repair steamer saved 500 persons, who were surrounded by burning lava, near La Precheur. Many wounded were found at Morne Rouge. Several ships have arrived bearing help and provisions."

SOLE SURVIVOR OF ST. PIERRE.

The correspondent of the London Daily Mail at Barbados, B. W. I., who visited St. Pierre on board the Royal Mail Steamer Solent, learned from a Dr. Artier, who escaped the disaster, that when the Governor of Martinique, M. L. Mouttet, and the insular officials had declared that all danger from an eruption of Mont Pelée was past, a cordon of armed soldiers and policemen was placed around the town to prevent the people from leaving. Dr. Artier, however, went to the suburb of Morne Rouge. He was riding back to St. Pierre when the explosion occurred. He turned and fled precipitately across the mountains to Fort-de-France. With the exception of the prisoner who was confined in a dungeon at the time of the explosion, Dr. Artier is really the sole survivor of St. Pierre.

The signal station at Castries, Island of St. Lucia, reported

that a large fire was seen in the evening of May 13th, in the direction of Fort-de-France, Martinique.

The British steamer Savan, Captain Hunter, arrived next morning and reported Mont Pelée to be still in eruption. The trend of the flow from the volcano was to the north.

The search parties which were removing the dead from St. Pierre discovered safes and molten precious metal in stores and dwellings of the town. No one was permitted to penetrate into St. Pierre beyond the street running along the sea front, and a cordon of soldiers was placed around the town. The St. Pierre Cathedral is all down, with the exception of one tower, and of the theatre the walls alone are standing. The convent, which contained 200 girls and 36 nuns, disappeared, as also the college, where 70 boys and 22 priests and professors were domiciled.

STREETS BURIED UNDER CINDERS.

A correspondent of the Associated Press wrote as follows:

"The destruction there is appalling. The streets are two feet deep in ashes and cinders, which cover thousands of dead bodies, scorched black and shiny, as if they had been plunged into boiling pitch. Many of the dead were never touched by the volcanic fire, and some of the houses and woodwork destroyed show no signs of burning.

"At Moudlage, in the southwestern portion of St. Pierre, the Town Hall is still standing as high as the first story, while at the fort, in the northwestern part of St. Pierre, the most massive stonework is calcined. The church tower, built by the Jesuits two centuries ago of Cyclopean mason work, is now like a huge heap of old metal.

"Soldiers are guarding property from prowling ghouls, who are robbing the dead. They meet with severe punishment when caught.

"The stench throughout St. Pierre is terribly offensive. The streets are still obstructed by huge piles of debris and dead bodies. The work of clearing the thoroughfares will necessitate the employment of large numbers of men for many months.

"Moudlage Rouge, near St. Pierre, is preserved, and Basse Pointe and Macouba are yet unhurt, but the crater is still active and smoke and ashes are blowing steadily northward. The surviving inhabitants are trying to cross from St. Pierre to the Island of Dominica in boats. Many drowning casualties are reported. Assistance is constantly arriving at Fort-de-France from all the neighboring islands."

NEEDS OF ST. VINCENT.

A despatch from London under date of May 14th was as follows:

"At a dinner of the West Indian Club held in London to-night the Hon. Arthur Ponsonby declared that, in view of the generosity shown by President Roosevelt and the American people toward the Martinique sufferers, the people of Great Britain should not be behind-hand in emulating President Roosevelt's example and helping their own countrymen on the Island of St. Vincent. Sir Arthur said he feared, however, that the fashion of donating funds for the succor of the victims of the disaster on the French island set by King Edward might lead Englishmen to overlook their suffering kinsmen at St. Vincent.

"C. T. Cox, the administrator of the Island of St. Kitts, in the Leeward group, spoke in the same strain as had Sir Arthur Ponsonby. Mr. Cox said: 'American philanthropy showers upon Martinique, yet no one in England has any idea how severely the inhabitants of the Island of St. Vincent must suffer, not only from loss of life, but the great loss of their trade, which in normal times is carried on on the hand to mouth basis.' Mr. Cox, who is on leave in England, expressed on behalf of the British administrators of the West Indian Islands, the deepest sympathy for both the French and British sufferers from the volcanic eruptions.

"Upon all sides bitter comparisons between the British Government's lack of action in regard to the sufferers in the West Indies and the prompt and material response of the United States to the emergency are being made.

"A. J. Balfour, the Government leader in the House of

Commons, will anounce in Parliament to-day the intentions of the Government respecting the relief of the survivors of the Martinique and St. Vincent disasters.

"Sir William Houlder, of Birmingham, has sent Joseph Chamberlain, the Colonial Secretary, £500 towards the relief of the West Indian sufferers.

"Messages of sympathy concerning the West Indian catastrophes are being voted by the public bodies throughout the United Kingdom."

EVACUATION OF ST. VINCENT SUGGESTED.

The Legislature of Kingston, Jamaica, voted $5000 for the relief of the sufferers of St. Vincent and Martinique. During the debate Secretary Olivier said it was not certain the Imperial Government even now would see the desirability in the interests of the inhabitants of evacuating the Island of St. Vincent. He knew Great Britain years ago considered a scheme for distributing the inhabitants among the other islands, and thought the recent hurricane and present calamity should decide the course of the Government.

The following statement was sent out from Washington, May 14th :

"The Navy Department received despatches to-day from Commander McLean, of the United States cruiser Cincinnati, and Lieutenant McCormack of the Potomac, both of which vessels are at Fort-de-France, Martinique. Commander McLean reports that he arrived at Fort-de-France this morning, and, having learned of the disaster in St. Vincent, had sent the Potomac to that island. Lieutenant McCormack, who reached Martinique before Commander McLean, reports that St. Pierre had been destroyed with its inhabitants and sixteen vessels that were in the harbor; that the surrounding villages were uninhabitable; that the island was covered with the work of destruction, and that provisions were needed within ten days to supply 50,000 refugees.

"Beyond giving orders to push the preparations for carrying relief to the afflicted people of the islands, nothing was done here

to-day. The resolution of the Senate passed yesterday to appropriate an additional $300,000 for relief remains with the House Committee on Appropriations. There is no opposition to making further appropriations, but members of the House Committee think it would be as well to wait and see the extent to which the $200,000 already appropriated and partially expended will reach in affording relief before taking further action in that direction.

"If it be found that the sum appropriated is not sufficient there is no doubt that the House will promptly concur in the Senate resolution appropriating an additional $300,000. The fact that the United States is the nearest country from which substantial relief can be sent to the afflicted people, and that supplies can be delivered within a few days, adds materially to the value of this relief. It is expected that the contributions being made by municipalities and individuals in this country and those from France and other European countries will speedily follow the supplies now on the way through the action of this Government, and these considerations have operated with the House Committee in suspending action on the Senate's resolution.

"If it should become apparent, however, that the appropriation of an additional sum is required to meet the emergency, there will be no hesitation on the part of the committee in bringing in the Senate resolution, nor will there be any delay on the part of the House in concurring with it.

RELIEF FROM PORTO RICO.

"The War Department was advised by Colonel Buchanan, commanding the military forces in Porto Rico, that the steamer Sterling had sailed to-day from San Juan with subsistence stores of every kind and clothing. The latter includes blankets, coats, trousers, underclothing, shirts, stockings and hats. These supplies were taken from the army stores at Porto Rico, and will be immediately replaced.

"The work of relief will be divided between the War and Navy Departments. The Navy will have full charge of the transportation, and the War Department will collect the supplies and

deliver them ready for shipment. The collier Leonidas, now at Port Royal, will be despatched to Martinique, orders having been issued to-day to prepare her at once for receiving supplies. It is expected that the voluntary contributions from the people will make it necessary to despatch one or two vessels in addition to the Dixie.

CARGO OF THE DIXIE.

"A memorandum, prepared by Commissary General Weston, shows that the commissary supplies sent to Martinique and St. Vincent cost $59,404, and weighed 900 tons, equal to 1,800,000 pounds. Allowing one pound to the ration, this quantity would well furnish subsistence for thirty-six days for 50,000 people. Among the articles provided are 982,200 pounds of rice, 214,300 pounds of hard bread, 85,000 pounds of flour, 65,375 pounds of bacon, 171,100 pounds of codfish, 3024 pounds of baking powder, 1440 two pound cans of currant jelly, 16,000 pounds of coffee, 4000 pounds of tea, 80,000 pounds of sugar, 516 gallons of vinegar, 4000 pounds of salt, 250 pounds of pepper, 6160 pounds of ham, 9600 cans of milk, 2400 cans of chicken soup, 2400 cans of beef soup, 1468 can openers. Three stores have been put in charge of Captain J. H. Gallagher, commissary, who will have personal change of their distribution.

"An official of the War Department said that the food and clothing shipped on the Dixie would undoubtedly suffice for the material needs of the survivors until the French Government is enabled to provide means of permanent relief.

"The President is very much gratified by the fact that every man named by him to act in connection with receiving contributions for the sufferers had telegraphed an acceptance."

The meeting in Paris called by the American Chamber of Commerce to raise funds for the relief of the West Indian sufferers was well attended, and over $2500 was subscribed in a few minutes to aid the destitute people at Martinique. The proceedings were brief and business-like. Henry Vignaud, the United States Charge d'Affaires, presided. President Francis Kimbel, of the Chamber of Commerce, explained the object of the meeting,

and H. Peartree moved, and H. Valois, seconded a resolution expressing the sympathy of the Americans of Paris with France in her sorrow. A committee was appointed to take charge of the American fund.

Municipal organizations, the Chamber of Commerce, religious bodies and public organizations throughout France sent the Government resolutions of sympathy concerning the Martinique disaster, and appointed committees to further the collection of funds to aid the West Indian sufferers.

Barnum & Bailey's Circus turned over the receipts of one performance to the Martinique fund.

CHAPTER IX.

For Weeks Mont Pelee Belched Clouds of Smoke. Splendid and Appalling Phenomenon. — Incessant Roar of Awful Thunder. — Terrors Paralyze the Helpless Inhabitants.

THE correspondent of the London Times at Paris, M. de Blowitz, supplied his paper with an account of the St. Pierre disaster, telegraphed to him by a friend from Fort-de-France, Martinique, by way of the Island of Malta. It said :

"For three weeks Mont Pelée had been vomiting clouds of smoke, but the smoke seemed produced so normally that it was permissible for even those who were inclined to look on the dark side not to dread a catastrophe. At Fort-de-France, where the agitation of Mont Pelée attracted, as it went on, much attention, any anxiety which existed, gradually died down when, May 5, a violent eruption of mud, the hot ashes having been mingled with water in the crater, overwhelmed Guerin's works, killing twenty-three persons, and the river in the north of the island, now swollen by a muddy torrent, noisily overflowed. On May 8, while there were still deliberations going on at Fort-de-France and St. Pierre, where the night had been passed in anguish and ignorance as to whether the eruption of mud was the precursor of or end of the disaster, St. Pierre was, within ten minutes, annihilated."

Describing St. Pierre after it had been demolished, the correspondent said :

"A portion of the upper town was razed by a cloud of fire, which increased, as it advanced, and crumbled everything in its course. In the lower town, near the harbor, a few walls, bearing traces of fire, remained standing. To the stupefaction of those familiar with the spot, the town clock remained intact, as if to show the precise moment of the disaster, and this sinister indication deeply affected all who saw it. On the other hand, the telegraph office and its contents were burned. Some fragments of

the apparatus were thrown a hundred yards. Bodies, whose attitude were perceptible, were lying prostrate, with the bowels protruding, as though forced out by the tension of the heat, and with the backs partially carbonized.

"It is a melancholy and most humiliating thing that the site of St. Pierre has to be guarded by the military, for numerous pirates from the neighboring islands were preparing to come and lay hands on anything of value."

Under date of May 12th the following despatch came from Kingstown, Island of St. Vincent:

"Scientists who have come here from the British Island of Trinidad predict another volcanic eruption on St. Vincent within a short time. The damage done to St. Vincent by the volcanic eruptions is now known to be considerably greater than was at first estimated. The present uneasiness of the inhabitants of the island is increased by the continuous agitation of the volcanic craters.

"Friday morning, May 9, large stones and volcanic dust fell in the neighborhood of Georgetown for two hours, terrifying the people there. A cloud of hot vapor then passed over that part. Two eruptions of less magnitude than the first occurred Saturday, May 10, and since then fire and smoke have been ascending at intervals from the craters. Owing to the great heat it is still impossible to approach the Soufriere volcano from the leeward side.

PHYSICAL CHANGES ON THE ISLAND.

"Interesting discoveries have been made regarding physical changes on St. Vincent resulting from the eruptions. Several fissures have been observed on La Soufriere. The estate of Walibou has disappeared, and has been replaced by an inlet of the sea. Richmond, an estate adjacent to Walibou, which was formerly flat and upon which there were several laborers' cottages, has been completely burned, and out of the estate there now rises a large ridge of ground. It is believed that the Rabacci crater, in the windward district of the island, has also erupted.

"From a distance La Soufriere, although less violent, still

wears a cap of dark clouds, which is lumined every now and then by flashes of red light. Volcanic dust fell here again yesterday. But fortunately there have also been several heavy rain showers, which have washed away the dust from the grass and restored verdure to the fields. The condition of the atmosphere is also apparently improving.

"Owing to the destruction of several estates, the sugar and arrowroot industries of St. Vincent are seriously injured. Destitution prevails among the laboring classes, who are without homes, without clothes and hungry. Nearly 2000 deaths on this island have been reported. Bodies have been discovered in houses in lifelike attitudes, presenting gruesome spectacles. There are decomposed bodies in many houses, and in order to guard against disease it will probably be necessary for the authorities to burn these dwellings. Owing to the many difficulties in the way of those who have the matter in hand, hundreds of bodies have not yet been interred.

THREE THOUSAND REFUGEES IN KINGSTOWN.

"No person has yet been able to approach within eight miles of the new crater of the Soufriere volcano. But judging from what can be seen from a considerable distance, the old lake at the summit of the mountain has disappeared. The numerous fissures in the mountain's sides continue to throw out vapor, and the subterranean murmurings and tremblings indicate continued unrest. During the afternoon of Monday, May 12th, a dense volume of steam and smoke rose from the volcano and the whole island was covered by a peculiar mist. The inhalation of noxious vapors here is increasing the spread of sickness.

"An ambulance corps from the island of Barbadoes has arrived here. Starvation threatens the poorer classes of the afflicted districts. Nearly every remaining negro hut in the Carib country contains decayed bodies, and the horrible stench is driving people away. Mutilated bodies are tied with ropes and dragged to the trenches, where they are buried. Sometimes bodies are cremated.

" The local government is feeding and sheltering about 3000 refugees. Subscriptions for the relief of the sufferers are being raised in all the British West Indian Islands."

From an officer of the steamer Solent, arrived at St. Kitts, British West Indies, from St. Pierre, May 15th, it was learned that Mont Pelée was still in eruption. Lava flowed in broad streams down the sides of the volcano. The entire island of Martinique, continued in a state of panic.

In St. Pierre the desolation was appalling. Bodies were being burned in a great pyre, upon which kerosene was steadily sprayed. In spite of this, it would be weeks before the place could be cleared of the dead.

DEATH CAUSED BY GAS.

Physicians who made examinations said that in most cases death was due to asphyxiation, and that the fire came later. It is now believed that Mont Pelée threw off a great gasp of some exceedingly heavy and noxious gas, something akin to fire damp, which settled upon the city of St. Pierre, and rendered the inhabitants insensible. This was followed by the sheet of flame that swept down the side of the mountain. This theory is accepted by the survivors who were taken from the ships in the harbor, as they said their first experience was one of faintness.

Looting was being sternly suppressed. Soldiers formed a cordon about St. Pierre, and only those who had business there allowed within the lines.

Great suffering continued in Martinique. Food was being received, but not in sufficient quantities to feed the crowds of refugees that flocked to Fort-de-France. The steamship Madiana, with food supplies purchased by the New York Chamber of Commerce, was near Fort-de-France.

By those who arrived from Martinique, it was said that the dumb animals were wiser than man. Mont Pelée long gave warning of the storm of fire which it was storing up to hurl upon the island. Residents of St. Pierre saw and heard the warnings, and they refused to heed them. They remained, and the danger

COPYRIGHT, 1898, BY J. M. JORDAN

INTERIOR VIEW OF CATHEDRAL, FORT DE FRANCE

COPYRIGHT, 1902 BY J. MARTIN MILLER

SCENE OF DEVASTATION AFTER THE LAST ERUPTION OF MOUNT PELEE

NATIVE WOMEN OF MARTINIQUE

MANGO TREE OF ST. VINCENT

A SILK COTTON TREE

IT PRODUCES SILKY FIBRES IN GREAT ABUNDANCE WHICH ARE USED FOR STUFFING PILLOWS, MATTRESSES, ETC. THE TREE AFFORDS PROTECTION AGAINST HURRICANES

INTERIOR VIEW OF RESIDENCE OF WEALTHY MERCHANT, NEAR ST. PIERRE, MARTINIQUE

which had long confronted them brought death to many thousands of human beings.

Even before Mont Pelée began to rumble, late in April, live stock became uneasy, and at times were almost uncontrollable. Cattle lowed in the night. Dogs howled and sought the company of their masters, and when driven forth they gave every evidence of fear. Wild animals disappeared from the vicinity of Mont Pelée. Even the snakes, which at ordinary times are found in great numbers near the volcano, crawled away. Birds ceased singing, and left the trees that shaded the sides of Pelée.

A great fear seemed to be upon the island, and though it was shared by the human inhabitants, they alone neglected to protect themselves.

MAGNETIC DISTURBANCES.

Otto H. Tittman, Superintendent of the United States Coast and Geodetic Survey, reported that the delicately suspended magnetic needles at the two coast and geodetic survey observatories, the ones situated at Cheltenham, Md., sixteen miles southeast of Washington, and the other at Baldwin, Kan., seventeen miles south of Lawrence, were disturbed beginning at about the time the catastrophe at St. Pierre is reported to have occurred. The wave of fire struck St. Pierre about 8 o'clock A. M., May 8, and a clock was stopped at 7.50 A. M.

The magnetic disturbance began at Cheltenham Observatory at a time corresponding to 7.53 St. Pierre local mean time and at the Baldwin Observatory 7.55 St. Pierre time. The delicate apparatus installed at these observatories is so arranged that it registers automatically by photographic means the minutest variations in the direction and intensity of the earth's magnetic force. It is a noteworthy fact that no seismological observatory had thus far reported a seismic disturbance during this eruption.

No magnetic effects due to eruptions of distant volcanoes have ever been recognized at magnetic observatories. Purely mechanical vibrations caused by earthquakes have been often registered by the delicately poised magnetic needles. The Gautemalan earthquake of April 18, for instance, was recorded not only

by seismographs at various places, but also at the Cheltenham magnetic observatory of the Coast Survey. This earthquake simply caused a mechanical vibration of the magnetic needles about their mean position of rest and lasted about one-half hour, whereas the disturbance of May 8 was a distinct magnetic effect, pulling the needles aside from their usual direction and lasting many hours.

SUPPLIES ON THEIR WAY TO THE WEST INDIES.

The following statement given out May 15th from Washington showed the progress made in affording relief:

"The probability is that the House Committee on appropriations will not take up the Senate resolution to appropriate additional money for the relief of the survivors of the West India disaster, unless advised by the President that further assistance from the Government is needed. Chairman Cannon had a conference to-day with the President, and as the result the House committee will hold the Senate resolution to await developments. It is the belief of the officials at the War Department that the supplies shipped to Martinique and St. Vincent on the cruiser Dixie from New York and on the collier Sterling from San Juan will be sufficient to meet the needs of the suffering people for fully a month.

"The present efforts of the Government officials are being directed to supplementing the food supplies contributed by the people so as to make them immediately available. Secretary Root has authorized the officers of the commissary department at New York to purchase any additional supplies that may be necessary to supplement those contributed by private firms and individuals for shipment to the scene of the disaster by the cruiser Buffalo, now loading at New York. or by other vessels. Consequently, private donations of flour will be supplemented by a proper supply of yeast by the Government, and the same with codfish and other food supplies which require other articles to make them available as food.

"The Government has already expended a little over $100,000

of the available appropriation of $200,000, and as much of the balance as it is necessary will be utilized in supplementing the food supplies contributed by firms or individuals. As has been already stated, the Government officials anticipated the action of Congress in providing for the immediate relief of the situation, with the result that the Sterling sailed from San Juan with supplies within five hours from the time the appropriation became available, and the Dixie sailed from New York with additional supplies in exactly twenty-nine hours after the President signed the act making the appropriation. These two vessels carry more than thirty-six days' rations for 50,000 people, together with a proportionate amount of clothing, tentage, etc.

"The supplies contributed by the people of the United States will be forwarded on the Buffalo, and on other vessels if necessary, and it is believed that it will not be necessary to expend any more of the appropriation except as indicated, to supplement the private supplies. These shipments were made to meet the pressing needs of the moment, and as they will provide for the material wants of the sufferers for over a month, it is believed that it may not be necessary for this Government to extend any further aid, as in the meantime the French Government will undoubtedly have made ample provision to meet the situation in a more permanent form.

RELIEF MEASURES BY BRITISH GOVERNMENT.

In a statement in the House of Commons, May 15th, regarding the measures proposed by the Government for the relief of the sufferers from the volcanic outbreaks in the West Indies, the Government leader, A. J. Balfour, in a reference to the steps taken, added: "We have taken account of the most sympathetic manner in which the United States Government have, to use their own language, expressed their desire to share in the work of aid and rescue. As to the manner in which this generous offer can be best acceded to the Government of the Windward Isles has already been consulted."

Mr. Balfour referred to the opening of the relief fund at the

Mansion House by the Lord Mayor, Sir Joseph Dimsdale, in behalf of the sufferers of the Island of St. Vincent, and said that Canada, Jamaica and the other West Indian Islands, and the Island of Mauritius, in the Indian Ocean, had promised to help with money and goods.

"I have no doubt," he added, "that the other colonies will be equally generous. In addition, the Governor of the Windward Islands has been authorized to spend whatever sums are necessary, and the Imperial Government is prepared to supplement the contributions from other sources to whatever extent may be needed.

"As regards the Island of Martinique, Lord Landsdowne, the Foreign Minister, May 12th, had instructed his Majesty's Ambassador at Paris, Sir Edmund Monson, to say that it would give the Government great pleasure to offer assistance in any manner most convenient to the sufferers from the calamity, and to say that if this country could help by the loan of doctors or the gift of medical comforts and provisions that we were prepared to act forthwith.

"The French Government replied, accepting with gratitude the offer of his Majesty's Government. From the nature of the case, there must a distinction between our own colonies and those of another Power in the expenditure of money. But the Government, as stated, is prepared to give comforts and provisions to sufferers at Martinique."

INDIFFERENCE OF THE PEOPLE OF PARIS.

John Dillon, Irish Nationalist, who first raised the question in the House and suggested that the authorization to the Governor of the Windward Islands to spend money ought to be extended so as to provide for the relief of the Martinique sufferers, as he considered it would be most unfortunate if a distinction was made, tried to move an adjournment of the House on this point, but the motion was rejected.

Writing from Paris, a gentleman made the following comments:

"The American visitors cannot understand the seeming

indifference of the Parisians in regard to the Martinique disaster. Beyond the half-masted flags over the Government offices, there are no signs of public mourning. The people flock to their usual resorts, attend the races, fill the theatres, none of which has been closed, no 'extras' are issued, and there is no demand for them. But the evening papers containing bulletins of the automobile race are eagerly purchased.

"The various funds being raised for the relief of the Martinique sufferers now only total 303,000 francs, including the large subscriptions of the foreign potentates and the 20,000 francs from the municipality. The provinces seem more interested in the disaster than the capital. They are actively organizing committees to raise funds, and there is much mourning at the seaports whose ships were destroyed.

"A representative of the Associated Press has just returned from the Ministry of the Colonies. Besides the reporters, those who were in the waiting room, around the green board on which the official bulletins are posted, were almost exclusively natives of Martinique. Occasionally a woman issued from the Minister's rooms in tears after learning the the fate of some loved one.

THE GOVERNMENT CRITICISED.

"The opposition is beginning to use the calamity as a club to beat the Government. The Nationalist Patrie says: 'We hoped that the fêtes at Brest would have been countermanded on account of the catastrophe, over which foreign sovereigns, courts and parliaments are mourning more than our own authorities. The flags are half-masted, but the military bands are playing as if 30,000 Frenchmen had not perished.'

"An American who has resided here for a long time said: 'The Parisians are constitutionally unable to become deeply interested in anything not connected with the capital. Have you not noticed that the papers are giving more space to the Humberts case than to the terrible loss of life at Martinique, while early this week they devoted pages to the death of Severo, the aeronaut, and only two columns to the West Indian catastrophe?'

"The Canadian Commissioner, Mr. Faber, called on the Minister of the Colonies, M. Decrais, and expressed, in behalf of the Government of Canada, the profound sympathy of the Canadian people with France in regard to the Martinique disaster, adding that he had received a cable message from the Minister of Finance, Mr. Fielding, to the effect that the Government of Canada had subscribed $25,000 to the relief fund, which amount was held at the disposition of M. Decrais."

The French cruisers Bruix and Surcouf were ordered to sail from Brest with supplies for the inhabitants of the Island of Martinique. Quantities of food, wines, preserves, etc., were taken.

EXAMPLE OF MAGNIFICENT GENEROSITY.

Two messages, expressing sympathy regarding the loss of life at St. Vincent, were received at the Foreign Office in London here from the United States Government. One was private and the other official. The former was verbally presented by Mr. Choate, the United States Ambassador, whom Lord Lansdowne, the Foreign Secretary, warmly thanked for the official message. The cablegram from Secretary Hay to Ambassador Choate was as follows :

"Express to British Government the sympathy of the President and the people of this country in the affliction which has befallen St. Vincent, and our desire to share in the work of aid and rescue."

The Colonial Secretary, Mr. Chamberlain, wrote to the Foreign Office, desiring Lord Lansdowne to very gracefully acknowledge and accept President Roosevelt's offer of assistance, and to inform Mr. Roosevelt that Mr. Chamberlain cabled to the Governor of St. Vincent asking for information as to the best method of utilizing the United States' offer. Until the Governor's answer was received nothing definite could be done.

The Colonial Office especially asked the Associated Press to announce that any relief intended for the inhabitants of the Island of St. Vincent could be safely sent, and would be wisely

distributed if addressed to the Governor of the Windward Islands, St. Vincent.

The Associated Press was authorized to announce officially, on behalf of both the Foreign Office and the Colonial Office, that President Roosevelt's offer created the deepest gratitude. They declared that no occurrence of recent years had so brought home to them the deep and material friendship existing between the two Governments.

Lord Monkbretton, Mr. Chamberlain's Secretary, said to a representative of the Associated Press : " We are, indeed, grateful to America. Our only difficulty is to insure an equitable distribution of the relief sent from all sources. Until we hear from the Governor of St. Vincent we believe it would be better to defer organizing a system of distribution, though anything sent to him will doubtless be well applied. Experience from previous disasters teaches us that unprincipled persons take advantage of charity, and that a man who has only had his pig sty burned down will demand a new house. We have heard nothing to-day, and find it difficult to communicate with St. Vincent."

CONTRIBUTIONS IN LONDON.

Mr. Chamberlain contributed $250 to the Mansion House West Indian relief fund. Much satisfaction was expressed at the opening of the Mansion House West Indian relief fund, while the tardiness of the action taken by the authorities was adversely commented on. Thus, the Westminster Gazette said .

"Once again, in the cause of charity, our kinsmen across the Atlantic have gained a substantial start, and have set the Old Country an example of swift and magnificent generosity, from which we might well benefit."

Capitalists were somewhat slow in subscribing to the Mansion House fund. Only $25,000 had been received, of which amount the Bank of England contributed $5,000 and the Corporation of London $2,500.

St. Paul's Cathedral and other churches arranged for special collections on Sunday in aid of the fund.

The Lord Mayor of Liverpool opened a West Indian relief fund. A telegram received announced the safety of Lady Llewelyn, the wife of the Governor of the Windward Islands, and her family, who were staying at St. Vincent at the time of the eruption of the volcano there.

A cable message from Kingston, Jamaica, confirmed the previous despatch of the Associated Press referring to the possibility, owing to the frequent disasters, that the Government would decide to abandon St. Vincent and transfer the people there to other islands.

FRANCE'S GRATITUDE.

M. Jules Cambon, the French Ambassador at Washington, transmitted to Secretary Hay a long telegram from his Government expressing the gratitude of France for the energetic efforts of this country to relieve the distress of Martinique. The text of the Ambassador's communication is as follows:

"Embassy of the French Republic, Washington, May 14, 1902.—Mr. Secretary of State: I have just received the following telegram from my Government: 'The President and the Government of the French Republic, deeply moved by the sympathy evinced by the President, the Congress and the nation of the United States toward the sufferers of the earthquake in Martinique, charge you to be their interpreter in expressing the gratitude cherished by the entire French nation for their generous assistance, the remembrance of which will live forever.'

"It is my great honor, Mr. Secretary of State, that I should be called to tender to you the thanks of France for all that the United States is doing on this sorrowful occasion, and I should be infinitely obliged to you if you would convey this expression to all in the Government and Congress who have given evidence of such noble sentiments of humanity.

"Be pleased to accept, Mr. Secretary of State, the assurances of my high consideration. "JULES CAMBON.

"The Hon. John Hay, Secretary of State, Washington, D. C."

On board the Danish cruiser Valkyrien off St. Pierre, May 11, a correspondent wrote:

"Where the city of St. Pierre stood there is to-day a molten hecatomb of lava, which proclaims the horrible story of the fate of the people of the city in a stench that was manifest in spite of the sulphur-laden air while the ship was yet twenty miles at sea.

"It is possible to penetrate the outskirts of the city from the south. Where the houses were more thickly built the river of liquid fire that poured down the side of Pelée had its greatest depths. It is now hardening, a lake of hot pitch, cinders and great bowlders hiding the bodies of the thousands it engulfed in an indescribably horrible doom.

"On every hand there are funeral pyres. Scenes beggaring description are enacted by the men who are striving to make some disposition of the dead that they may not remain a menace to the living. In the narrow streets, in the gardens and fields, partly covered by the deposit of ashes that settled after the whirlwind of fire, hundreds of bodies are lying.

CORPSES PLACED IN PILES.

"Wherever there is a spot that is easily reached little groups of men are engaged in dragging together the bodies of the victims. The corpses are piled together. Coal oil is poured over the wood that has been torn from the beached vessels and the horrible work of destroying the menace of pestilence goes on. Above and beyond the present horror there is in the minds of those who have taken up the work of destroying the corpses a still greater horror. The plague stalks in the wake of the eruption of the volcano.

"An hour ago I left the Deputy Governor, M. L'Heurre. Reeking with the fumes of coal oil, his clothing in rags, his face showing the horror of the work in which he was engaged, he stepped back after applying the match to a dreadful pile. He is directing the work in person. He explained to me that it needed but little direction. Those who had volunteered for the labor of salvaging the city were inspired by the common desire to get rid of the corpses.

"'It is no longer a disagreeable duty that we do altogether from motives of humanity,' he said to me. 'It is a duty to the

living. The thousands of unburied dead must be disposed of or the island will be given over to the plague and blotted from the earth, practically.

" 'We have not the material for the work. We have taken all the coal oil that was procurable; we have seized all the wood that could be had. Alas! it would take a forest of wood and a lake of oil to do the work. There are still countless corpses in every direction, and unless we are soon provided with means to expedite the work of cremation we will be driven out.

" 'It has not yet been possible to approach the center of the city and the salvaging has not been progressing. It is not wealth that we are seeking, but trying to render the place habitable to go on with the work. It would be impossible to do anything at all but for the despairing energy of the men who have lost family and fortune in the catastrophe. I am here to see the body of my chief, the Governor, who met his death at his post. I have no means of telling just how many died in the overwhelming of the city.'

"The story is told in two words: There are but two survivors. Thousands died in the deadly storm of fire and ashes that extended miles beyond the reach of the lava spread.

"The work here is carried on in the face of such a death as was the portion of those who died here last week. That cloud hangs over the summit of the mountain. At times there is a rumbling and a flame leaps a mile into the air. These outbreaks are generally followed by a shower of stones and hot mud, but no more lava reaches the site of the city.

TREASURE IS RECOVERED.

"Treasure to the amount of two and one-half million francs has been found in the vaults of the Bank of Martinique and is being put on board ship.

"And even while the awful work of the men who are building funeral pyres is going on, ghouls have forced their way into the city and are robbing those homes of the dead that may be entered.

"Guards have been posted now and the soldiers have orders to shoot any person acting suspiciously. Negroes from the planta-

tions, having lived down their dread of death, are committing unspeakable crimes.

"Corpses have been mutilated for the sake of the jewelry on them. Desperate chances have been taken by men who fight their way through still hot ashes to get into houses that are the tombs of their former owners.

"Famine, too, menaces the people here. At present they have a little supply of food, but it must be replenished in a few days or they must give up their work.

"On board the Valkyrien, which has between its decks about 850 refugees, picked up along the northeast coast of Martinique, is one of the two known survivors of all the people of St. Pierre.

SAVED IN PRISON.

"The grim irony of fate speaks in him. His name is Monat. He was a prisoner in the city prison. From him was had the only story that has been told of the overwhelming of the city. Monat is a negro, a native of Martinique. He speaks French fluently—as do all the natives. He was serving a short sentence in the jail.

"He was ill of a fever the night before the eruption and to that fact he is indebted for being alive to-day. He begged the jailor to permit him to spend the night in the dungeon of the prison, where he might allay the burning of the fever on the cold stones. He was at liberty to walk about the cellars of the jail when the end came for every other living thing in St. Pierre except himself and and an old woman, who has since died.

"'It was early in the morning that it occurred,' he said, 'I had been in the jail yard and went back into the cellar. The air was stifling. There was a cloud over Pelée, but that was not unusual. I went back into the cellar to get out of the heat and was near the foot of the steps leading down from the yard when there was an explosion. It was as though all the thunder that ever roared and all the cannon in the world had been set off at once.

"'I fell on my face, knocked down by the shaking of the earth

by the explosion. I could not have lain there a moment when I recovered my senses. There was a roaring sound as though the houses were being torn to pieces.

"'It was perfectly black all about me, and down through the door of the cellar there was a blast of wind coming that was like a flame. I thought I had died and was in hell.

"'The door of the cellar swung shut and I lay still. The heat drove me mad. I could not stay there. I found the door and opened it.

"'The wind was blowing a gale and so hot that I could not breathe. It was not so dark, but the air was full of ashes and I went blind. I dipped a rag in a water bucket and tied it over my face, then went out.

"'The roaring was fearful but it was peace compared to the thunder that came from Pelée every few minutes. I made my way on my hands and knees to the back wall of the jail yard. I took the rag off my eyes and saw that the wall had been thrown down and had fallen into the bay; the prison was on the edge of the water. The front part of the jail was moving along with other houses. I thought I was mad.

TRIED TO CRAWL ON BEACH.

"'I could see about me for some distance. There was not a being in sight. A dreadful fire was flashing from the houses, that seemed to be covered with hot mud. The heat made me frantic and I threw myself down over the broken wall into the water, or where the water had been.

"'I fell on the stones and broke my leg. The tide had gone out, but it came roaring in a tidal wave, and I was thrown up on the stones of the broken wall.

"'I tried to crawl along the beach and fell into what looked like a mud puddle. It was burning hot and nearly burned my arm off.

"'I found a place under a rock where there was some water that was not hot. I stayed there that day and all night. I could see out but saw no one.

"'A great stream of mud was running over where St. Pierre had been and into the sea. It sent up clouds of steam, and it wet the ashes and they fell like rain.

"'The next day I crawled south along the beach. I saw no man nor woman, nor even a dog. I thought I would drown myself, but I must have fainted, for I knew nothing until I was aboard the ship.'

"A man who saw the eruption from the deck of the Portuguese bark Oporto, and who escaped death, after being thrown overboard, by fastening himself to the bowsprit of the vessel, which stood out of the water when the bark went down, tells something of the story of the eruption in lucid intervals. The man has been insane at times from his sufferings. He was at work on the deck of the bark at 7.30 on the morning of the cataclysm of fire.

"'I heard first a roar that rent the air and sky and made the masts of the bark to quiver. The ship shivered as though she were alive. I cannot describe the noise, for it left me senseless for an instant. When I stood up the ship was careening from side to side. The whole sky was black except over Mont Pelée.

GREAT SHAFT OF FLAME.

"'There was a great upright shaft of flame that must have reached for miles, and could be seen as though it were night. I could see leaping from one side of the pillar of fire a great streak of black mud. While I am telling it to you the stream reached the city.

"'The bark was only a few fathoms from the shore and I could see the people rushing about. Hundreds had run out of their houses at the first awful roar. Most of them were kneeling in the streets. It only seemed an instant before the mud and ashes begun to fall into the bay. St. Pierre, with all its houses, all the people praying and running about in the streets, all—everything, had been swallowed up by the stream of mud.

"'The stream reached the bay at the same instant that the mud and ashes and stones began to fall out of the sky. There

was an awful hissing sound as the black tide rushed into the water. The sea rushed back from it, the air was seething with mud, steam and rocks—and it was all over. I don't remember anything more of it.'

"It is understood from masters of vessels who have been in the neighborhood of the island of St. Vincent that the St. Pierre horror has been repeated there.

"No man has yet been able to effect a landing on the island and it is known that Soufriere has been in a state of eruption for several days. All here who have the courage to speculate have given themselves to the idea that the entire population of St. Vincent has been obliterated, as was that of St. Pierre. The refugees on board the Valkyrien say that there is not a green thing living in the northern part of Martinique.

"So far as the shores of the island can be seen from the Valkyrien this is true of other portions of the island, and the ashes from the volcano have made a barren and horrible waste of what was a week ago one of the garden spots of the world. The Valkyrien will go from here to Fort-de-France, and possibly to St. Vincent."

CHAPTER X.

NEW HORRORS REVEALED DAILY—MONT PELÉE AGAIN IN ACTIVE ERUPTION.—RIVERS AND LAKES DRIED UP.—HISSING PITS OF LAVA.—PHYSICAL CHANGES MADE BY THE OUTBREAKS.

FROM Fort-de-France it was learned on May 16th that the descriptions of the ruin wrought by the volcanic outburst of Mont Pelée fell far short of the reality :

"Most remarkable are the topographical changes wrought by the eruption of Mont Pelée. Subterranean activity is by no means ended, and in the northern part of the island wide crevasses are forming, cutting off the northern from the southern half of the island. A remarkable change in the ocean bed off the northern coast has been noted. In some places the lead sinks fully thirty fathoms deeper in the sea than it did previous to the eruption before finding bottom. This easily explains why cable communication with the island was cut off. New craters are forming on Mont Pelée in the district traversed by Riviere Blanche (White River).

"Morne la Croix, the peak of Mont Pelée, is the centre of most curious electrical phenomena. At times the air is cut and slashed with electric discharges, and during the nights of May 11 and 12 a ball of fire and luminous clouds lighted up the ruined country for miles. There is a fresh flow of lava in the Riviere Blanche, and Basse Pointe has been evacuated on account of the heavy, unceasing rain of cinders and ashes.

"Work in St. Pierre is proceeding slowly and under circumstances of the utmost difficulty. Attracted by the hope of loot, bands of pillagers have invaded the ruins. Troops have been placed on guard, with orders to deal with the vandals as befits their shameless crimes. Twenty-seven women and three men have been brought to Fort-de-France and lodged in jail on charges of robbery. Two men who were caught in the act of pillaging and on the appearance of a squad of troops sought to escape in flight were shot.

"It is reported here that an English officer, found to have stolen the sacred altar vessels from the ruins of the Cathedral in St. Pierre was put under arrest and taken to St. Lucia on board the United States cruiser Cincinnati. His name and connections cannot be learned.

"Work in the ruins is dangerous. Crumbling walls are a serious menace to working parties. It is urged by many that what remains of the city should be leveled with dynamite. Even when bodies are found their identification is difficult or impossible. Inhabitants of the districts near St. Pierre have been forced to quit their homes on account of the odors from the dead and gaseous emanations from the volcanic craters.

"Public services of all kinds are sadly impeded by the heavy task that has fallen upon the authorities in distributing in the southern part of the island the refugees from the northern part. On May 18th, 653 bodies were buried. Funeral services were held in the Cathedral of Fort-de-France. The local authorities, officers from the French cruiser Suchet, the American navy tug Potomac and the German cruiser Falke were present.

PANIC IN ST. VINCENT.

"No one has been able to approach nearer than five miles to the crater of the St. Vincent Soufriere, which still shows signs of activity. Scientists believe that the volcano has not stopped emptying, and there is general expectation that there will be another and severe explosion. The island is constantly in a tremble. Earthquakes follow one another in quick succession. They are not sufficiently severe to do great damage, but they fill the inhabitants with fear, and if it were possible to obtain transportation it is safe to say that St. Vincent would be depopulated in twenty-four hours.

"The Soufriere seems to have completely changed its shape. Its top has disappeared, and from a distance the mountain looks as though a mighty thumb had been pressed upon it, crushing down its apex. Where a pretty blue lake of great depth existed a fortnight ago there is now a bubbling cauldron of molten lava. Above

this clouds of smoke and steam constantly rise. Over the entire island spreads a peculiar mist, which is injurious to the eyes, and which contains noxious properties that cause much distress.

"Some of the huts built by the Carib Indians still stand, and in every one there are bodies. Scattered about in the open also there are hundreds of bodies, blistering in the terrible heat. The result is that an effluvia spreads over the Island of St. Vincent which is nauseating, and which threatens a pestilence that will further decimate the population. Such precautions as are possible are being taken to ward off fevers, but the most that can be done is very little.

"Burial parties have been sent out. Bodies are being dragged with ropes to trenches for interment, and cremation has been resorted to. One great trouble lies in the fact that many of the bodies are too close to the Soufriere to be approached. Until the volcano quiets down they must remain to add to the stench that is now almost unbearable.

STARVATION EXISTS.

"Starvation is a condition that actually exists in St. Vincent. Three thousand refugees are being fed and sheltered by the Government near Georgetown and Kingstown, but other thousands are in need of food. Supplies are coming in, but not fast enough to meet the demands. It is reported that relief ships are hastening to Kingstown, and in a few more days it is believed that there will be food in plenty.

"The water famine is causing more distress than the lack of food. Many of the former supplies of water have disappeared. Rivers that were running bank full before the explosion of Soufriere are now dry. Lakes have evaporated, and only in the south half of the island is there any living water that can be reached. Down the east slope of the volcano a stream of water can be seen flowing, but no man has approached close enough to it to tell whether it is fresh or impregnated with sulphur, as much of the water of the island is.

"The United States cruiser Cincinnati arrived at St. Vincent from Martinique two days ago. Officers report that the war vessel passed through heavy showers of ashes. They say that Mont Pelée is still blazing, and that the danger from it has not passed. These officers insist that the American supplies must be distributed by the American Consul, or, at least, by an American committee. The Martinique funds are exhausted, and persons bringing relief are far from pleased with the attitude of the local committee that have had charge of affairs in Fort-de-France. There is a strange apathy exhibited there which Americans cannot understand.

"An election set for Sunday, May 11, was actually held in Fort-de-France, and the contest at the polls was as keenly contested as would have been possible had Mont Pelée not killed 30,000 persons, a score of miles away, just three days earlier.

PITIABLE CONDITION OF THE REFUGEES.

"A relief expedition sent to Martinique has just returned to Port of Spain, after delivering the supplies sent from here. One of the members of the expedition gave this interview: 'We arrived at Fort-de-France early in the morning of May 12, and at once made arrangements for landing our supplies. The Acting Governor expressed keen appreciation of our mission, and, of course, the ordinary customs duties were not collected. The food was greatly needed. We saw hundreds of refugees entering the city, some of them without anything except the clothes worn by them, and a few carrying their belongings on their heads. They were apparently dazed, and did not know what to do to care for themselves. The Governor said medical supplies were not needed, as there were no injured. We were struck with the apparent apathy of the inhabitants of Fort-de-France. Their calmness while speaking of the catastrophe was something remarkable.

"'It is impossible to give an adequate description of the conditions we found existing in Martinique. The country for miles around St. Pierre is covered with sand and ashes. The

stench that comes from the bodies in St. Pierre is so strong that it is very offensive five miles out at sea.

"'Our party landed at St. Pierre, but we were able to penetrate only about 300 yards. All became ill. We had disinfectants, but they did not seem to make an impression upon the stench.

"'Mont Pelée was still belching smoke and lava. Scientists who made a study of the situation say the heat must have been about 300 degrees. The bodies were incinerated, and the stone walls were crumbled.'"

EFFICIENT RELIEF WORK.

"I covered St. Vincent yesterday on horseback, visiting fifty miles of the stricken territory," said a correspondent, writing from St. Lucia, "with its terrible scenes of devastation. The government has buried 1300 victims. One hundred are in the three hospitals at Georgetown. Refugees are flocking into Georgetown and Kingstown, as the blacks are panic-stricken. The burned living cattle wander in agony on the roads. Water is scarce, and a vast area of crops is under ashes. The entire northern section of the island is covered with a depth of ashes that ranges from a coating at Kingstown to eighteen inches near the volcano.

"The minimum of the dead is put at 1700 and the maximum at 2000. It will soon be thousands. The destitute in the rural districts are everywhere suffering. Native laborers refuse triple pay for burials. The disaster radically differs from that at St. Pierre in the great area and almost entirely rural districts affected. Georgetown, which is nine miles from Soufriere, has been badly damaged by the rain of stone and ashes and by lightning.

"Among the incidents noted is that of a school teacher and his wife and family of ten killed together. On the road to Waterloo in one room twenty-six people were killed. One married couple were found dead hand-in-hand, but their baby was alive lying at its mother's breast.

"Hundreds of native shacks were burned by the lightning. There are from one to three bodies in each. We saw horrible

scenes in the hospitals, where the wounded were dying on the floors, the native nurses being utterly inefficient. One hospital was lighted by two tiny lamps and by twisted rags in saucers of kerosene. The coffin makers were hammering away in the rooms adjoining, and the dying had no beds to lie on.

"The British Government officials are active and claim they can handle the relief measure alone. This is in marked contrast to the French outfit at Martinique, where little has as yet been officially done. Captain McCormack, of the Potomac, offered Governor General Llewellyn the sympathy of the American Government and the assistance of the Potomac and its food supplies. Governor Lleywellyn in answer said that in Martinique the needs were greater, as the sister British colonies were helping St. Vincent. The British cruiser Indefatigable brought twenty-five tons of supplies from Trinidad, and there are more coming. The Potomac took Governor Llewellyn's despatches and proceeded to St. Lucia."

AMERICAN SUPPLIES REACH MARTINIQUE.

Secretary Moody received the following cablegram, May 16th, from Commander T. C McLean, of the Cincinnati:

"St. Lucia, May 25.—Six thousand refugees have come into Fort-de-France. Three thousand have come into Kingstown. Northern portions Martinique and St. Vincent very many people perished; other suffering for food and water. Very great difficulty relieving and saving so many people scattered over large areas. Number of people to be fed and cared for said to be reduced by mortality. Have coaled here. Return to Fort-de-France and St. Pierre to-day. Will endeavor to recover records of American and British Consulates at St. Pierre. If remains of officials are found will bury with military honors."

Later the Department received a cablegram announcing the arrival of the Cincinnati at Fort-de-France. A telegram also was received, announcing that the collier Sterling, which took a quantity of stores from San Juan, Porto Rico, had arrived at Fort-de-France.

Late in the afternoon the Navy Department received an unsigned cablegram, dated at St. Lucia, and apparently from Lieutenant McCormack, of the Potomac. It read as follows: "Island St. Vincent devastated north of line Georgetown, east Chateau Belaire, west. Sufferers, country people. Dead, 1700; destitute, 5000. Immediate relief supplied by local Government. Destitution will continue several months."

RUINS OF ST. PIERRE INFESTED WITH PILLAGERS.

Says another despatch from Fort-de-France:

"St. Pierre is infested with pillagers, who are forcing safes. The authorities are taking severe measures. Fifty of the ghouls have already been arrested and imprisoned in Fort-de-France, where the population wanted to lynch them. The criminals were sentenced to five years' imprisonment.

"The Government has appointed accredited representatives of the commercial community to explore the ruins in St. Pierre for valuable books and papers. An English officer, accused of robbing the sacred vessels in the ruins of the church, has been taken to St. Lucia on board the United States cruiser Cincinnati, and will be placed under arrest there. Troops have been detailed to guard the ruins of St. Pierre, with orders to fire upon pillagers.

"There were 663 bodies interred yesterday, making a total of 1200 buried thus far. The work of interment is presenting great difficulties. Funeral services in memory of victims of the volcanic eruption were held to-day in the presence of the officers of the French ship Suchet, the German man-of-war Falke, the Danish ship Valkyrien and the United States Navy tug Potomac. Intense emotion was displayed by the audience. The inhabitants of the north part of the island are now distributed in the various districts of the south. Some Italian sailors were saved who were thought to have perished at the time of the eruption."

Another correspondent writes as follows:

"La Trinite, Island of Martinique, F. W. I. (Filed at Fort-de-France), May 16.—Since early this morning I have been traveling over the desolated eastern portion of the island and am heart

and brain sick at the sights witnessed. The smoke of Mont Pelée obscures the landscape, and showers of ashes continue to fall intermittently. On the lower levels of the road I encountered many fleeing from their homes. Property owners are arming to protect their estates from bands of robbers who are trading on the chaotic condition of the country.

"In company with the Mayor of La Trinite and Fernand Clerc, a candidate for the French Assembly and a prominent agriculturist, I spent much time encouraging and pacifying the country people, who are now in a state of panic. The police and soldiery also lent active service, and if there is no further eruptions quiet will soon be restored. I saw at the hospital of Trinite Edouard Lassere and Paul Simmonet. They told me they were driving to St. Pierre on the morning of the great catastrophe and got caught in the very edge of the cyclone of gas and flame that came out of Pelée's new crater. So close were they to the burning, suffocating cloud that their mules and driver were killed by it, and they—Lassere and Simmonet—were badly burned.

SAVED BY A NEEDLE.

"M. Clerc told me that, noticing a violent oscillation of the needle of the barometer, he hurried with his family to Morne Rouge an hour before the disaster. M. Bauzalan, a manager of one of the Clerc estates, met a bitter fate, he and his family of eighteen being completely wiped out.

"I am sending this cable to Fort-de-France and am pushing on toward the north crater. There are plenty of scenes of volcanic violence and danger in the upper reaches, but so complete has been the destruction of life that I fail to perceive any signs of destitution.

"After leaving La Trinite and Grande Anse, I entered the real zone of volcanic effect.

"Everything here was covered with a layer of mud, unlike the dust seen in the regions below. Judging from what I saw here I should imagine that great streams of fire and gas fell toward St. Pierre and water and mud nearer to the crater and toward the

north. At noon I reached Morne Rouge, several miles from St. Pierre.

"Here I met the Bishop of the Catholic Church, who was attending to everything, although deserted by the other clergy. I gave him a hundred francs with which to succor his poor people.

"Mont Pelée has again broken into activity, and threatens further destruction to the island of Martinique. Work among the ruins of St. Pierre and the suburban village of Carbet has ceased, the searchers and the burial parties having been forced to flee to escape the outpouring from the volcano's crater. Many refugees had returned to their homes, believing that Pelée had quieted. They are now again in full flight, and the distress is increased. The rural police, who have been patrolling the northern end of the island, have left their posts.

"Search was being made by a party from the United States Navy tug Potomac for the body of Thomas T. Prentis, the United States Consul at St. Pierre, who, with all the members of his family, perished under the sweep of flame that came down from Mont Pelée the morning of May 8th.

AMERICANS FLEE FROM MONT PELEE.

"That search has now been abandoned, and the Americans have returned to Fort-de-France. They report that the volcano is in a most vicious mood, and that before they left St. Pierre ashes and mud were raining upon the ruins. It is now believed that the body of Consul Prentis cannot be recovered. Governor L'Huerres intended making a tour of inspection of the island to-day, but owing to the renewed activity of Mont Pelée, the trip was not a success.

"On the French cruiser Suchet the party proceeded to St. Pierre, intending to spend several hours there. It was seen that Mont Pelée was smoking, but the conditions were not deemed dangerous. Boats were lowered and all of the officials started for the shore. Before a landing was made the volcano exploded with a terrific noise. The force of the eruption was not in the direction of St. Pierre, and no damage was done, but the investigators

fled precipitately back to the Suchet, which immediately put out to sea. It was at this time that the workers among the ruins abandoned their labors, and took refuge in flight.

"After leaving St. Pierre the Suchet turned northward, and at half speed made its way along the coast, taking soundings as it went. It was discovered that the bed of the ocean has been radically changed by the upheavals that have accompanied the explosions of the volcanoes. In some places the bed of the ocean has dropped beyond the reach of the deepest plummet. At other points rocks have been forced to the surface that do not appear on any chart, and which have never before been noted.

"Three days ago when I started on a trip through the island there was panic everywhere. I met men, women and children struggling toward Fort-de-France. All were so badly frightened that they seemed dazed. They were almost afraid to look behind them. As I rode back to Fort-de-France yesterday I met many of these refugees who were returning to their homes. Some were even going to the sides of Mont Pelée. Now there is once more panic, even in Fort-de-France.

THE COLLIER STERLING ARRIVES.

"From Puerto Rico has arrived the United States collier Sterling, with 150 tons of supplies. There is now little distress here, most of the urgent needs of the refugees having been filled. From all of the West Indian Islands provisions have been sent to Martinique, and from the United States such large quantities of provisions are being forwarded that all danger of famine is past.

"There is danger, however, of pestilence, and unless thorough precautions are taken there will be an epidemic of disease. It has been estimated that there were four hundred explosions within the volcano between May 4 and May 8, each being followed by an eruption of lava, mud and ashes. Since May 10 there have been many alarms, but no eruption accompanied by a loss of life until to-day, and the extent of the present trouble cannot now be told.

"According to the Bishop of the northern province, no mud or lava fell upon the country districts, which were, however, freely

besprinkled with ashes, which, being analyzed, show that they are of mineral origin.

"Mont Pelée probably gave a demonstration of a force of which the world before knew nothing. The mysterious rush down the volcano's side is now attributed to electricity. It is believed that it was an electric flame, traveling with cyclonic force and rapidity. It cut a swath as clean as could have been accomplished by a mechanical agency.

"Outside of the immediate heat zone the damage was not great. An iron sugar roller standing in the path of the flame was affected in a most singular manner. One-half was melted, while the other half was scarcely touched by the intense heat.

"Only about one-fifth of the entire area of the island was touched by the destructive power of the volcano. Ashes fell elsewhere, but already vegetation is forcing its way up through the top mantle, and a hard rain will wash away the eruptive matter, except in that part of the island lying directly at the foot of Mont Pelée. The streams are flowing as usual, and there is no longer any danger of a water famine. Cattle are suffering for want of food, but this will not last long.

RECOVERING FROM THE SHOCK.

"In the absence of symptoms of further eruptions of the Soufriere volcano, the inhabitants of St. Vincent are gradually recovering from the shock of the disaster. Most horrifying details of the condition of the Carib country, where dead cattle and human bodies lay several days during the agitation, are told. Although the number of deaths in the island due to the disaster is estimated, judging from the missing inhabitants, at two thousand, up to the night of May 13 only 1268 bodies had been buried. The undiscovered bodies are probablycovered with lava.

"In a small shop, which was opened three days after the eruption, eighty-seven bodies were discevered, and not one of them was recognizable. In the dwelling house of the manager of one of the estates thirty bodies were found in a similar condition, and other terrible discoveries have been made. The district is being

rapidly cleared. Many persons are suffering from fractured skulls, caused by the stones thrown from the volcano, and from burns.

"There was a slight convulsion May 17th. It was followed by a small discharge of smoke, but this caused no alarm. The weather is fine and the excitement is abating. The bed of lava in the windward district is still hot. The abyss, 500 feet deep and 200 feet wide, which existed between Langly Park and Habbacci, is filled with lava, and the physical features of the mountain on either side are apparently more beautiful than before eruption.

"A curious circumstance connected with the eruption is that the earthquakes were not general, notwithstanding the smallness of the island. In Chateau Belair the convulsions preceding the eruption of May 7 were almost continuous. In Kingstown and Georgetown sixty shocks were felt in four hours.

SIXTEEN SQUARE MILES OF LAVA.

"Although attended with smaller loss of life, the eruption of the Soufriere was not less violent than that of Mont Pelée, in the island of Martinique. The area covered by lava here comprises sixteen square miles. The fact that the loss of life and damage to property in St. Vincent were smaller than in Martinique is due to the position of the Soufriere and the smaller population of the district, the mountain overhanging sugar and arrowroot estates and a couple of thinly populated villages.

"Officials of St. Vincent are busy relieving the sufferers and housing the injured and homeless. The problem now facing the government is how to provide permanently for the natives who lost all they possessed. Peasant settlements may be formed on the estates which the government possesses, but money is needed to assist the settlers to build houses thereon and to provide them with sustenance during the cultivation of their land."

Weird and interesting were the experiences of the crew of the British steamship Horace, of the Lamport & Holt line, which reached New York from St. Lucia May 18th, and later in the day was berthed at the Woodruff Stores, at the foot of Joralemon

street, Brooklyn. The Horace carried a large cargo of coffee and was commanded by Captain Byrnes.

She touched at Barbados, and had a decidedly interesting time in the vicinity of Martinique on Friday, May 9th, when, despite the fact that she was one hundred and twenty-five miles from Mont Pelée, the ship's decks were covered with lava dust to the depth of several inches. It was only through what seemed providential accident that the steamer's engines were saved from disastrous injury as a result of the storm of lava dust which covered them.

The Horace brought the information that the visitation of St. Pierre was looked upon by the superstitious islanders as a judgment of God.

"While in St. Lucia," said an officer of the vessel, "I heard several of the residents telling one another that they believed the destruction of St. Pierre was a terrible punishment sent by the Almighty on account of the wickedness of the city. I don't know about the Divine retribution, but I do know that St. Pierre was a pretty bad place."

STATEMENT OF ENGINEER.

"We had cleared from Barbados," said Second Engineer Anderson, "and were making our way to St. Lucia, where we were to complete our cargo, take on a little more coal and then clear for New York

"On the afternoon of May 8 (Thursday) we noticed a peculiar haze in the direction of Martinique. The air seemed heavy and oppressive. The weather conditions were not at all unlike those which precede the great West Indian hurricanes, but, knowing it was not the season of the year for them, we all remarked in the engine room that there must be a heavy storm approaching.

"Several of the sailors, experienced deep water seamen, laughed at our prognostications, and informed us there would be no storm within the next sixty hours, and insisted that, according to all 'fo'cas'le' indications, a dead calm was in sight.

"So unusually peculiar were the weather conditions that we

talked of nothing else during the evening. That night in the direction of Martinique, there was a very black sky, an unusual thing at this season of the year, and a storm was apparently brewing in a direction from which storms do not come at this season.

"As the night wore on those on watch noticed what appeared to be great flashes of lightning in the direction of Martinique. It seemed as though the ordinary conditions were reversed, and even the forecastle prophets were unable to offer explanations. Occasionally, over the pounding of the engines and the rush of water we thought we could hear long, deep roars, not unlike the ending of a deep peal of thunder. Several times we heard the rumble or roar, but at the time we were not certain as to exactly what it was, or even whether we really heard it.

VIVID FLASHES OF LIGHT.

"There would suddenly come great flashes of light from the dark bank toward Martinique. Some of them seemed to spread over a great area, while others seemed to spout skyward, funnel-shaped. All night this continued, and it was not until day came that the flashes disappeared. The dark bank that covered the horizon toward Martinique, however, did not fade away with the breaking of day, and at eight in the morning of the 9th (Friday) the whole section of the sky in that direction seemed dark and troubled.

"About nine o'clock Friday morning I was sitting on one of the hatches aft with some of the other engineers and officers of the ship, discussing the peculiar weather phenomena. I noticed a sort of grit that got into my mouth from the end of the cigar I was smoking. I attributed it to some rather bad coal which we had shipped aboard, and, turning to Chief Engineer Evans, I remarked that 'that coal was mighty dirty,' and he said that it was covering the ship with a sort of grit.

"Then I noticed that the grit was getting on my clothes, and finally some one suggested that we go forward of the funnels, so we would not get the dirt on us. As we went forward we met

one or two of the sailors from the forecastle, who wanted to know about the dust that was falling on the ship. Then we found that the grayish looking ash was sifting all over the ship, both forward and aft.

ASHES RAINED ON THE SHIP.

"Every moment the ashes rained down all over the ship, and at the same time grew thicker. A few moments later, the lookout called down that we were running into a fog bank dead ahead. Fog banks in that section are unheard of at nine o'clock in the morning at this season, and we were more than a hundred miles from land, and what could fog and sand be doing there. Before we knew it, we were into the fog, which proved to be a big dense bank of this same sand, and it rained down on us from every side. Ventilators were quickly brought to their places and later even the hatches were battened down.

"The dust became suffocating, and the men had all they could do to keep from choking at times. What the stuff was we could not at first conjecture, or rather, we didn't have much time to speculate on it, for we had to get our ship in shape to withstand we hardly knew what. At first we thought that the sand must have been blown from shore. Then we decided that if the captain's figures were right we wouldn't be near enough to shore to have sand blown on us, and as we had just cleared Barbados, we knew that the captain's figures had to be right.

"Just as the storm of sand was at its height Fourth Engineer Wild was nearly suffocated by it, but was easily revived. Just about this time it became so dark we found it necessary to start up the electric lights, and it was not until after we got clear from the fog that we turned the current off. In the meantime they had burned from nine o'clock in the morning until after two in the afternoon.

"Then there was another anxious moment shortly after nine o'clock. Third Engineer Rennie had been running the donkey engine, when suddenly it chocked, and when he finally got it clear from the sand or ashes, he found the valves were all cut out, and then it was we discovered that it was not sand, but some sort

of composition that seemed to cut steel like emery. Then came the danger that it would get into the valves of the engine and cut them out, and for several moments all hands scurried about and helped make the engine room tight, and even then the ashes drifted in and kept all the engine room force wiping the engines clear of it.

"Toward three o'clock in the afternoon of Friday we were practically clear of the sand, but at eleven o'clock that night we ran into a second bank of it, though not as bad as the first. We made some experiments, and found the stuff was superior to emery dust. It cut deeper and quicker, and only about half as much was required to do the work. We made up our minds we would keep what came on board, as it was better than the emery dust and much cheaper, so we gathered it up.

"That night there was more of the same electric phenomena toward Martinique, but it was not until we got into St. Lucia, where we saw the Roddam, that we learned of the terrible disaster at St. Pierre, and then we knew that our sand was lava dust."

The volcanic ash which fell on the decks of the Horace was ground as fine as rifle powder, and was much finer than that which covered the decks of the Etona, which reached port a few hours before.

BLISTERED PAINT AND ASHES.

Although the crew had been kept busy scrubbing and cleaning the ship, the decks and every part of the vessel showed the effects of the fiery storm through which it had passed. All about the decks ashes could be seen working out of cracks and crevices where the brooms of the men had not reached. In places the paint was blistered, and in the loftier portions of the ship the white paint looked as if it might have been partly melted and then coated over with the sifting ashes. In the lifeboats and elsewhere were little mounds of the volcanic dust, caked in hard masses by the dew and the sun. In his cabin Captain Byrnes had a large jar filled with the ashes that had fallen upon the deck as the ship came away from St. Lucia, passing St. Vincent.

One of the officers of the Horace described the storm of ashes

through which they passed as being like a severe snowstorm with the thermometer at 100 degrees. "It hurt our eyes and choked us, and the air was so filled with the fine dust that we could not see half a mile ahead. The most harrowing picture of all I saw was that of Captain Freeman, who escaped from the Roddam. As we seen him in St. Lucia, he scarcely looked like a man, he was burned and scarred so badly. He sat with his arms supported on pillows, and he said to me jokingly that there wasn't enough flesh left on one of his arms to bait a fish hook."

AS SEEN FROM ST. LUCIA.

Henry Chastenet, a native of St. Lucia, was the only passenger on the Horace. He said he left St. Lucia for the purpose of visiting his friend, J. L. Clavier, of New York, but his story indicated that his departure from the island was for the purpose of escaping possible destruction.

"There is a volcano on the island of St. Lucia," he said, "but it is said to be practically extinct. That is what they said about Mont Pelée; that is what they said about the sulphur pit on St. Vincent, but we all know what has happened."

"Could you see anything of the terrible outburst on Martinique from St. Vincent?" he was asked.

"No," he said, "only the hideous bursts of angry blue flame, which would leap far up into the black clouds like the sudden burst of flame from a mighty blast furnace. Then would come darkness and a mighty wrenching and shaking of the earth, with a noise that sounded as if all the powers of the universe were struggling under your feet."

Advices received at Washington, May 17th, from Consul Ayme and Commander McLean, of the cruiser Cincinnati, both of whom were at Martinique, indicated that sufficient supplies were at hand to meet the emergency, and suggesting that public subscriptions in this country should be discontinued. For the present, therefore, it was said, no further supplies would be sent to Martinique by the Government, and it was probable the President would make public announcement within a few days that

further contributions were not needed. The President called upon the army and navy officers in Martinique to express their views upon the sufficiency of the supplies available, and when their replies were received he will take action.

Secretary Moody made public this despatch received from Commander McLean: "Excitement in Martinique calming down. Many refugees, not destitute or starving, but frightened by appalling disaster at St. Pierre, and grave but less serious damages in more northern portions of the island, were leaving estates and sections which had not suffered. Many cases of pillaging in those districts. Government taking action to stop it. In some northern districts many cattle may die because volcanic dust covers vegetation. A few good rains would cure much of this condition. To-day visited and explored ruins United States and British Consulates, St. Pierre. Found in some portions charred remains of bodies. The Potomac has returned to Fort-de-France. Reports disaster at St. Vincent very serious. I believe volcanic conditions are worse, and in some respects conditions of living as bad or worse than in Martinique."

OPINIONS AT WASHINGTON.

Said a Washington correspondent:

"In the opinion of the President and his Cabinet, the domination of the Western Hemisphere by the United States has been conclusively demonstrated by the extension of relief to the stricken islands of the Caribbean Sea. These islands belong to foreign powers—France and Great Britain. Before these nations took the first step in the direction of sending them assistance the President called upon Congress, and that body appropriated $200,000 for the despatch of the relief to Martinique and St. Vincent. The President furthermore ordered that supplies be transported to St. Vincent. Orders that relief be sent were given before the State Department communicated information of the President's purpose to France and Great Britain. Announcement to this effect was made, and with its presentation by American diplomats the fact of foreign sovereignty was not lost sight of.

"A diplomat called attention, however, to the fact that the United States had established a precedent of the utmost importance. When distress prevailed in Cuba, in consequence of Spanish operations, the President called upon this country to furnish the reconcentrados with relief. This step was regarded as the first stage of intervention. It is not proposed by the Administration to use the action taken in Martinique as a precedent for any further procedure than that required by the dictates of humanity, but it is pointed out that the President's course has an important international aspect."

COMMEMORATIVE SERVICES.

At the close of High Mass in all of the Roman Catholic churches of Paris in the morning of May 18th, funeral psalms were chanted and prayers for the dead were said in memory of those who perished in the Martinique disaster. The congregations were large, and good collections for the aid of the West Indian sufferers were taken up.

At a special service held in the Church of St. Augustine Bishop Cormont, of Martinique, who was in Paris, pronounced absolution. The commemorative service for the Martinique dead, which was to have been held at Notre Dame, was postponed because of the absence from France of President Loubet, as this service was intended to be a high religious and State function. Appropriate services for the Martinique victims were held in all churches throughout France, and collections to aid the sufferers were taken up.

The performance of Barnum & Bailey's circus at Toulouse yesterday added $5000 to the Martinique fund.

The Norton Line steamer Etona arrived at New York from the River Plate, via St. Lucia, where she called for bunker coal on May 10.

"At St. Lucia on May 11," said Captain Cantell, "I went on board the British steamer Roddam, which had escaped from the terrible volcanic eruption at Martinique three days before. The state of the ship was enough to show that those on board must have

undergone an awful experience. The Roddam was covered with a mass of fine bluish gray dust or ashes of cement-like appearance. In some parts it lay two feet deep on the decks. This matter had fallen in a red hot state all over the steamer, setting fire to everything it struck that was burnable, and when it fell on the men on board burned off limbs and large pieces of flesh.

"I visited the captain of the Roddam in the hospital at St. Lucia, where he gave me an account of his terrible experience. He had just arrived and anchored at St. Pierre, Martinique, on the morning of Thursday, May 8. The captain was standing near the accommodation ladder talking to the agent of the vessel, who had come on board, when he saw what appeared to be an enormous black cloud, like a wall with patches of fire in it, approaching the sea from the land.

"With it came an immense tidal wave of boiling water, accompanied by a loud and terrible noise. He shouted, 'take shelter' to the crew. Immediately the steamer was caught and tossed over on her side, almost capsizing. Darkness fell like a pall, and volumes of red hot matter showered down, while the air was thick with sulphurous fumes and dust. The sea was a confused mass of boiling mud.

THE ENGINES STARTED AT FULL SPEED.

"The captain of the Roddam, knowing that his vessel had steam up, and instantly realizing the necessity of escape, rushed to the engine room annunciator and signaled below to start the engine at full speed. The anxious moments, increased by his sufferings from burns and agony of mind, were relieved by the vibration of the engines and the reply from below. It happened, fortunately, that, although the crew had been rung off from duty at the engines, some of the engineers were nearby. The terrible tidal wave which had swept over the Roddam and nearly capsized her had parted the cable, and the vessel was adrift.

"When the engines started it was found that the steering gear had become disabled in some manner and could not be worked. For more than an hour the Roddam's engines were worked, back-

ing and going ahead, with the hope of bringing her head toward the sea and away from the land. Once she got dangerously near the steamer Roraima. Both vessels were in flames. Some of those aboard jumped into the boiling water; some fell dying to the deck. All this time the red hot matter was falling, and the water was hissing and steaming dense masses of vapor. Smoke and dust filled the air, and poisonous fumes spread about.

TERRIBLE PLIGHT OF THE STEAMER.

"After some time the Roddam's steering gear moved a little and enabled the captain to head her out to sea, and with considerable difficulty he managed to steer her a little distance from the land. As the air cleared the scene on board the ill-fated Roddam became all the more ghastly. The ship steamed on through thick hot dust. The screams from the injured became more audible. Some rushed frantically about with their clothes on fire and large pieces of flesh burned from their arms; others in their agony lay writhing in the red hot dust.

"In about two hours the air became gradually clear. An investigation of the casualties on board showed that, besides the captain, who was frightfully injured, only two engineers, two sailors and the boatswain were able to do duty. Fire was still burning about the ship, and the rigging was in flames. The captain decided to try to reach the Island of St. Lucia, forty-five miles distant. This he succeeded in doing by 6 o'clock on the evening of May 8.

"In the time occupied on this terrible voyage the experience of the survivors was still worse than that already gone through. The brave captain and his few men fighting the fire, exhausted and scalded, struggled and worked trying to do something to assist their dying shipmates. Those working below strove to keep up the steam. The captain, suffering the greatest agony, succeeded in navigating his vessel safely to the port of Castries, St. Lucia, with eighteen dead bodies lying on the deck and human limbs scattered about.

"A sailor stood by constantly wiping the captain's injured

eyes. I think the performance of the Roddam's captain was most wonderful, and the more so when I saw his pitiful condition. I do not understand how he kept up; yet, when the steamer arrived at St. Lucia and medical assistance was procured, this brave man asked the doctors to attend to the others first, and refused to be treated until this was done."

Every storm, earthquake or disaster of any kind brings out a curious phase of human nature. Many of those who have seen their houses destroyed or their nearest relatives killed returned as soon as possible to the scenes of devastation. In some instances this is explained by the fact that there are more opportunities of earning a livelihood among old neighbors than among new surroundings.

In numerous cases, however, no such business reason operates as an iducement. The magnet is sentiment, not money. As some mourners devote every holiday to visiting graves, so a large fraction of the homeless and bereaved go back to spend the remainder of their days in the scenes that recall calamity and agony.

RISKING DANGER.

It was so after the great London fire; it was so after the Lisbon earthquake; it was so after the yellow fever swept Philadelphia; and in more recent years, the Chicago fire, the Mississippi floods, Charleston, Johnstown and other catastrophes confirm the old experience. Apparently the desire to gain new pleasures is not more keen than the wish to revive the memory of old pain. Our late storm has destroyed much property and a number of lives, but we will see people choosing homes in sight of the telegraph pole from which the fatal live wire dangled, or the flooded stream in which the only son was drowned.

Johnson's "Rasselas" tells of sundry thoughtful persons who, wearied of their life in Abyssinia, go forth to seek adventures. During the Nile's annual flood they are obliged to halt, and they resolve, when the inundation shall cease, to return to Abyssinia. Johnson's blinking eyes looked sharply into human nature.

The well-known journal, the New York Independent, printed an editorial on the catastrophe, which we here reproduce :

Such a terrible catastrophe as that which last week suddenly overwhelmed a city, paralleling the destruction of Pompeii, and then repeated itself on a neighboring island, simply blotting out Martinique as a land of fair homes and extinguishing its agriculture and business, and destroying half of St. Vincent, raises the old question again, how our better Theism can deal with such fearful events. Think of the sudden ferocity of this power! the top of the mountain suddenly blowing off, spouts out molten lava, which not merely flows in a stream from which one might flee, but drops in showers of fire over the doomed city and far out on the ships at sea. Thus perished Sodom and Gomorrah. But St. Pierre was no special wicked city. Its people were as decent as those of Paris or Havana, and St. Vincent needed, so far as we can see, no unusual vindictive judgment from heaven or hell.

CHAIN OF NATURAL CAUSES.

The problem is easy to the consistent materialist. To him all is involved in the chain of natural forces, which have no purpose and no praise or blame. What was in the primal egg of cosmic mist had to evolve itself unthinking and unpitying. We can grieve and lament or we can rejoice, but the arrow shot from the original nebular star-dust moves straight on, unknowing and relentless. There is a chain of cause and effect, and effect follows cause mechanically. There is law, only law, and no will, no heart, no love and no hate. Such is the materialist view, and it offers the comfort of despair.

But Theism has before it the same facts, the same relentlessness of nature. Given a God, he lets the lightnings fall, the tornadoes blow, the earthquakes shake, the volcanoes burst, quite regardless of the presence of men. Indeed, the belief in a divine superintending Power brings in a fresh difficulty, the difficulty which every thinking soul has felt, that of the permission of evil. If God is good, why does He allow evil? Can He not help it? Is He all-powerful, or is He not all-good?

Believing in God, we believe that He created nature and gave it its laws. There are those whose notion of God requires them to believe that He gave nature no laws or powers, but that every act of nature, every dropping of an apple, every chemical combination, every evaporation of a drop of dew, is a special act of Divine will exercised on nature, and they say that what we call laws of nature are only God's habit of doing things. This is a needless way of maintaining the Divine rule over nature. It involves the disagreeable thought that every mischief of fever, or flood, or storm, or flame is the effect of a special volition of God to that particular end.

It is wiser and more philosophical, as well as more natural, to think of nature as controlled by laws imposed upon it, those laws acting automatically, although their action can, to some extent, be cotrolled or diverted by the opposing will of living beings. Cattle can prevent the growth of grass in a pasture; men can turn a forest into a field of wheat or a sandy shore into a city. The Theist must think of God as having made laws for nature that are good in their general effect. That hydrogen should combine with oxygen to form water is good; that carbon and oxygen should make carbonic acid is good, and vegetation depends on it. But every law, though generally beneficial, may be exceptionally injurious in its action; yet that is no reason why its steady rule should fail.

MUST LEARN TO AVOID EVILS.

We must learn to understand the rule and avoid its evils. We must not step off from the precipice; we must not build our cities on the flank of a volcano. We must learn to rejoice in the beneficence of the law and submit to its unavoidable injuries.

The comfort and the peace must come in the thought of the general goodness of law and the advantage that follows from the fact that we depend on its certainty. We do not need to wait for some great catastrophe to learn this lesson. When a friend dies we are not to think of it as a judgment of Heaven on us for our sins, as if God were sending a special chastisement; we are to

think of it as nature's, and so God's wise way of removing and renewing the generations; and if our ignorance or neglect of some law of nature has hastened the end of one's life, we should take the blame to ourselves and learn the more how to make these laws our kindly servants. If to some minds this seems to remove God further from us, seated behind the law, to other wiser minds God will be seen enthroned within the law, giving it its power and rejoicing, as should we, in its general beneficence.

CHAPTER XI.

SHIP TOSSED BY GIANT WAVES WITHOUT A BREATH OF WIND. STORY OF THE CAPTAIN OF A DANISH VESSEL.—LONG HOURS OF TERROR ENDURED BY THE CREW.—WRECK OF THE SHIP RODDAM.

THE Danish steamship Nordby, sulphur-laden from the Isle of Sicily, reached Philadelphia, May 17th, after an experience which the old salts on board said they never saw equaled, and hoped never to see again. The Nordby ran into a mysterious sort of storm, caused by the volcanic eruptions at Martinique, when several hundred miles away from that place. For twelve hours of a windless and cloudless day the vessel was buffeted and tossed about in a terrifying fashion. The crew, dazed and puzzled by the phenomenon, expected every moment that the next would be their last.

As told in simple style by Captain Eric Lillienskjold, the story of the ship's plight is graphic enough to be a creation of fiction.

"On May 5," said the captain, "we touched at St. Michael's for water. We had had an easy voyage from Girgenti, in Sicily, and we wanted to finish an easy run here. We left St. Michael's on the same day. Nothing worth while talking about occurred until two days afterward—Tuesday, May 7.

"We were plodding along slowly that day. About noon I took the bridge to make an observation. It seemed to be hotter than ordinary. I shed my coat and vest and got into what little shade there was. As I worked it grew hotter and hotter. I didn't know what to make of it.

"Along about two o'clock in the afternoon it was so hot that all hands got to talking about it. We reckoned that something queer was coming off, but none of us could explain what it was. You could almost see the pitch softening in the seams.

"Then, as quick as you could toss a biscuit over its rail, the

Nordby dropped—regularly dropped—three or four feet down into the sea. No sooner did it do this than big waves that looked as if they were coming from all directions, at once began to smash against our sides.

"This was queerer yet, because the water a minute before was as smooth as I ever saw it. I had all hands piped on deck, and we battened down everything loose to make ready for a storm. And we got it all right—the strangest storm you ever heard tell of.

"There was something wrong with the sun that afternoon. It grew red and then dark red and then, about a quarter after two, it went out of sight altogether. The day got so dark that you couldn't see half a ship's length ahead of you. We got our lamps going, and put on our oilskins, ready for a hurricane.

"All of a sudden there came a sheet of lightning that showed up the whole tumbling sea for miles and miles. We sort of ducked, expecting an awful crash of thunder, but it didn't come. There was no sound except the big waves pounding against our sides.

NO BREATH OF WIND.

"There wasn't a breath of wind. Well, sir, at that minute there began the most exciting time I've ever been through, and I've been on every sea on the map for twenty-five years. Every second there would be waves fifteen or twenty feet high belting us head-on, stern-on and broadside, all at once. We could see them coming, for without any stop at all flash after flash of lightning was blazing all about us.

"Something else we could see, too. Sharks! There were hundreds of them on all sides, jumping up and down in the water. Some of them jumped clear out of it. And sea birds! A flock of them, squawking and crying, made for our rigging and perched there. They seemed as if they were scared to death.

"But the queerest part of it all was the water itself. It was hot—not so hot that our feet could not stand it when it washed over the deck—but hot enough to make us think that it had been heated by some kind of a fire. Well, that sort of

thing went on hour after hour. The waves, the lightning, the hot water and the sharks, and all the rest of the odd things happening, frightened the crew out of their wits.

THE CREW PRAYED.

"Some of them prayed out loud—I guess the first time they ever did in their lives. Some Frenchmen aboard kept running around and yelling, 'C'est le dernier jour!' [This is the last day.] We were all worried. Even the officers began to think that the world was coming to an end. Mighty strange things happen on the sea, but this topped them all.

"I kept to the bridge all night. When the first hour of morning came the storm was still going on. We were all pretty much tired out by that time, but there was no such thing as trying to sleep. The waves were still batting us around and we didn't know whether we were one mile or a thousand miles from shore.

"At 2 o'clock in the morning all the queer goings on stopped just the way they began—all of a sudden. We lay to until daylight; then we took our reckonings and started off again. We were about 700 miles off Cape Henlopen. No, sir; you couldn't get me through a thing like that again for $10,000. None of us was hurt, and the old Nordby herself pulled through all right, but I'd sooner stay ashore than see waves without wind and lightning without thunder."

And according to his records Captain Lillienskjold must be a pretty brave man. During the Turko-Grecian war he ran his steamer Ashby up against a blazing Turkish schooner and rescued thirty-three of its crew. For this the Sultan awarded him the Order of Medjidi, a decoration given to admirals in the Ottoman service.

Such of the Nordby's crew as could speak English and all her officers told the same story about the mysterious storm. It was not until the Nordby reached Delaware Breakwater late Friday night, May 16th, that the captain and his sailors learned of the volcanic disturbances in the West Indies. Then they understood, or said they did, what caused their own troubles.

One of the ships that passed through a shower of lava from Mont Pelée and reached the American mainland to tell about it, the British Etona, bound to New York from Montevideo and St. Lucia, steamed up the Narrows before daylight on the morning of May 18th. Her captain, John Cantell, and her four passengers, Professor Ulo Kraft, of the Hessen (Germany) High School; H. R. Babbitt, the Buenos Ayres representative of Robert H. Forderer & Co., of this city ; Julio Buchwald, of Buenos Ayres, and Rinaldo Bibolini, of Paraguay, brought with them a thrilling story, not only of their own experience in the second eruption of Martinique's destroyer, but of the Roddam and her heroic captain, whom they visited in the St. Lucia's hospital

The Etona reached St. Lucia on the evening of May 10th, expecting to coal and leave the same night. She had experienced queer weather during the day, the atmospheric disturbances indicating that something had happened either in the sea or on land. In the harbor news was received of the St. Pierre disaster, and lying at anchor was all that was left of the Roddam.

All St. Lucia was in mourning and the people were so distracted by the news from the neighboring island that it was not until May 11th, that Captain Cantell could obtain coal and proceed on his journey. St. Pierre was passed at a distance of about four miles and all on board studied the land with glasses.

ALL WERE FRIGHTENED.

"The weather was clear and we had a fine view," said the Captain yesterday, "but the old outlines of St. Pierre were not recognizable. Everything was a mass of blue lava and the formation of the land itself seemed to have changed. When we were about eight miles off the northern end of the island Mont Pelée began to belch a second time. Clouds of smoke and lava shot into the air and spread over all the sea, darkening the sun. Our decks in a few minutes were covered with a substance that looked like sand dyed brown, and which smelled like phosphorus.

"I was on watch at the time with Second Officer John G. Gibbs. When partial darkness came upon us it is needless to say that I

and everybody else on board the ship were badly frightened. After the stories we had heard and the sights we had seen at St. Lucia we did not know but that we were ourselves to be buried under red hot lava or engulfed by another tidal wave, though we were then ten miles from shore.

"'Crowd on steam!' I whistled down to Chief Engineer Farrish, and he needed no urging. Slowly we drew away through a suffocating atmosphere, foot by foot, yard by yard, and at last the sun began shining again. We had passed outside the storm of dust and sand. When I looked at my watch I found that we had been about an hour reaching daylight.

"Our decks were covered two inches deep with this material;" and the Captain exhibited a box of volcanic dust, which had been saved by his crew. "You can see the marks of it yet about our masts and polished wood work, and I do not think my passengers are yet over their fright. No curiosity would every take any of us again near that terrible place."

Captain Cantell said that he saw several steamers moving about Martinique, but could not distinguish their names. He talked with the captain of a small steamer which left St. Lucia, May 9th, for St. Vincent to offer relief, but which had to turn back. When within seven miles of St. Vincent the needle in the compass began to spin round and round and point everywhere except toward the north.

WRECK OF THE RODDAM.

"Before leaving St. Lucia," said Captain Cantell, "I offered to carry supplies to Fort-de-France, but was told that a ship had gone over with everything needed. While we were waiting at St. Lucia for coal we visited the wreck of the Roddam, which escaped from St. Pierre on May 8. We found the ship in charge of a watchman and two policemen. She had been abandoned by all of the survivors of her crew. When we went aboard the watchman was engaged in gathering up fragments of human bodies and putting them away in a locker. He discontinued the work to show us around.

"The Roddam presented an awful spectacle. She looked as if she had been thrust into soft, clinging mud and pulled out again. The mud stuck and clung to her like cement, and was two feet deep on her decks. Awnings, stanchions and boat covers had been burned or swept away. Tarpaulins, rails, stays, hatch covers and even her smokestacks were gone. When the watchman dug into the lava he found here and there fragments of human remains. About all that was left of the ship was her hull, and that being of iron, had escaped destruction.

"Hearing that Captain Freeman was at the Hotel Felilé we called upon him. I wanted to get from his own lips the story of his escape. I was unprepared for the terrible sight which greeted my eyes when I entered the room.

"Captain Freeman's face was burned to the color of teak wood, and large patches of skinned flesh were burned from his bones here and there. Both of his hands were swathed in bandages. His hair and mustache were gone, his eyes were tied over and he was in great pain. When I told him who I was he talked a great deal, to relieve himself, he said, of his suffering.

CAPTAIN FREEMAN'S STORY.

"He said the Roddam had been in St. Pierre only an hour when the eruption occurred. He was talking to an agent in a boat alongside when a big black squall approached the ship from the land. It was like a wall, traveled fast, and was accompanied by a tidal wave and a deafening roar. The sun disappeared immediately.

"Captain Freeman said that he shouted to everybody to stand clear. An instant later the air was filled with flame and falling batches of fire. The ship was immediately ablaze from end to end, and the crew and laborers aboard began to rush about, frantic with pain. As nearly as he could remember there were forty-two persons aboard the ship, only six of whom survived. The ship keeled over when the tidal wave hit her and near capsized. Then she righted and the falling shower of fire continued.

"Captain Freeman ran into the chart room, but was driven

out again by flames that came in at the porthole. Then he rushed to the engine room telephone and signalled the engineer to put on full steam. Some one responded, and the ship began to move, but the steering gear was jammed and would not work. He kept the engines going ahead and astern alternately, hoping to free the paddles, and in so doing nearly collided with the Quebec line steamer Roraima, from which clouds of steam and flame were rising.

"Men on the Roraima were wringing their hands and rushing about frantically. Some of them jumped into the sea, where they must have died instantly, Captain Freeman said, for the water was boiling like a cauldron. It was like a mass of boiling mud. Many of the Roddam's crew had disappeared, probably swept overboard, and the rest went one by one until only six were left. Every one of them must have died a terrible death.

HEADED OUT TO SEA.

"After a time the captain got the steering gear working, the ship answered her helm, and he headed her out to sea. Slowly the sky cleared, and it was possible for him to see about him. Men in the red hot lava lay dying all along his track. He himself, though he stayed at the wheel, was unable to lift his burned arms. Blood from his forehead kept running into his eyes, obscuring his vision. He likened his escape to the passage from hell into heaven. At last he reached the open sea, and with the help of two sailors, two engineers and the boatswain succeeded in taking his ship to St. Lucia.

"During the run out of the harbor the chief engineer died a horrible death. He escaped the first shock, started the engines, and not finding his men below, went on deck to look for them. As he thrust his head out of the hatch a mass of lava fell upon him, burning one side of his face completely off.

"Captain Freeman's performance has, perhaps, never had a parallel in stories of the sea," continued Captain Cantell. "When the Roddam arrived at St. Lucia the brave man refused all medical treatment until the others were cared for. He will live, the

doctors tell me. I saw two sailors, two engineers and the boatswain in St. Lucia. They were able to get about.

Julio Buchwald, of Buenos Ayres, who came in on the Etona, was on a visit to his brother. Rinaldo Bibolini was one of the party. They, Professor Kraft and H. R. Babbitt told the same thrilling tale as the captain.

"We knew long before we reached St. Lucia," said Mr. Babbitt, "that something was going on. We couldn't see St. Vincent at all as we passed that island. A thick haze, like steam, hung over the sea and shut out all sight of land. Our ship was a sight after we passed through the shower of lava dust. All of us have gathered up samples of it to show as souvenirs of our experience. Not a spot on the deck's superstructure but was covered with the blue stuff. The air was stifling and you couldn't see across the deck. It was an experience to last a lifetime.

Chief Engineer Robert Farrish said of the lava shower:

"We had been watching the island from the time we first picked it up until we were well past St. Pierre, and I had just gone below, put up my glasses and stretched out on my bunk for a nap, when the captain sent for me. As I came on the bridge he said. 'Look at that island, will you?'

"I looked, and there the volcano was belching out a black cloud of what looked like dense smoke.

"'Get below,' he said, 'and drive her as hard as she will stand until we get clear of this place. We don't want a repetition of the Roddam's experience.'

CROWDED ON STEAM.

"I went below and gave her all the coal the furnaces could take. We had good coal and plenty of it and we did not hesitate to use it. I pounded her through at an increase of two knots an hour over what we had always thought was her highest speed. The safety valves were dancing a jig every minute, but, notwithstanding the high rate of speed we were running at, there was scarcely a minute during the hour that we were flying from the scene of the eruption when the head of steam in the boilers did not force the safety valves open.

"When I came on deck two hours later we had left the island hull down, but the decks of our ship were a sight. Everywhere everything was covered with the blue lava dust, which the force of the volcanic eruption had driven in the face of the wind ten miles out to sea and scattered over us.

"This dust as it fell on the ship was moist and sticky in character. It made the decks slippery, much as though they had been plastered with soft clay. When it dried out it became like a fine powder. In many places the decks were buried two inches deep from the shower."

Abramson, carpenter of the ship, said that he was lying out in a hammock under an awning on the forward deck, from which he had been watching the island of Martinique through a glass as they passed it. A little before two o'clock in the afternoon he noticed that the sun was taking on a peculiar condition. It was shining brightly, yet seemed surrounded by a thick haze, but finally it took on a fiery red appearance, and, while still perceptible in its entire contour through the haze or smoke, its circumference kept apparently contracting. It grew smaller and smaller until finally, Abramson said, it looked no larger around to the naked eye than an ordinary tumbler.

A BLOOD-RED SUN.

About this time there came a sudden puff of dark smoke, the edges of which were tinged with light, as though reflecting the rays of the blood red sun. This cloud moved toward the ship like a black squall. Before the captain's orders to take in the awning could be executed, the shower of lava poured onto the ship and covered everything. The smokestack of the Etona was buried thick in the stuff, which caked thereon and hardened so that it took several days to get it off. The peculiarity about this dust that caked on the smokestack was that when dried it hardened in appearance much like cinders, instead of fine dust like that which fell on deck.

The Martinique disaster took place just where scientists would expect it. Dr. A. R. Crook, professor of mineralogy in

Northwestern University, of Chicago, has made a special study of volcanoes. He has made an ascent of the two highest in the world, and has climbed many others for purposes of study. He is an authority on volcanography.

"There are two great circles of volcanoes about the earth," he said. "One girdles the earth north and south, extending through Terra del Fuego (called 'land of fire' because of its volcanoes), Mexico, the Aleutian Islands, and down through Australia; the other east and west through Hawaii, Mexico, West Indies, Italy (including Mount Vesuvius) and Asia Minor.

"These two circles intersect at two points. One of these is the West Indies, which include Martinique, the scene of this terrible disaster; the other is in the islands of Java, Borneo and Sumatra. On the latter islands there are extinct volcanoes. On the former is the terrible Pelée. It is just at these points of intersection of the two volcanic rings that we expect unusual volcanic activity, and it is there that we find it."

BASED ON THEORY.

Professor Crook said it was impossible to predict an eruption. "There has been more or less theorizing," he continued, "as to volcanic disturbances moving in cycles, but it cannot be proved. One fact is established, and that is that a volcano is an explosion caused by water coming in contact with the molten mass below the surface of the earth. This is proved by the great clouds of steam that accompany the action."

The old theory that the center of the earth is a molten mass the professor says is no longer held. He asserts the latest idea is that the center of the earth is more rigid than glass, though less rigid than steel. About this there is more or less molten matter, and over all the surface crust of the earth. This molten matter causes the surface of the earth to give, to sag, and form what is called "wrinkling." When water comes in contact with the heated mass an explosion follows that finds its outlet through the places where there is least resistance, and the result is a volcano.

"There is no part of the earth's surface which is exempt from earthquakes," said Professor Crook, "and there is no regularity in their appearance. Volcanic eruptions are almost always preceded by earthquakes somewhere in the circle. Recently there were earthquakes in the City of Mexico in which many lives were lost.

"As it is impossible to predict when the next will take place, it is also impossible to tell where it will be. It will certainly be somewhere in the line of the two circles.

"All this is of interest as showing that the earth is still in process of formation just as much as it was a billion years ago. We see the same thing in Yellowstone Park. There most decided changes have taken place even in the last eight years. Old Faithful, which used to play regularly every sixty minutes, now does so only once in twice the time."

When asked what contributions to science, if any, might be expected from investigations at Martinique, the professor expressed a great desire to go there.

BENEFIT TO SCIENCE.

"Even new elements might be discovered," he said, "and seismic theories either confirmed or disproved. A volcano always throws off a great variety of materials, hydrochloric and sulphuric acids, iron, silica (sand), sulphur, calcium and magnesium. The lava is of two kinds. That which is easily fusible flows more rapidly than a horse can trot. A more viscous kind cools into shapes like ropes. The latter is common in Hawaii."

"Why do people live near volcanoes?" was asked. "Don't they know they are loaded?"

"Yes. The danger of the proximity is usually well known, but the iron oxides render the soil extremely fertile. You see this in Sicily about Etna and Vesuvius. You see it also in Martinique, where the area forty miles square was occupied by 160,000 people."

The professor then spoke of the probable character of the death of the unfortunate victims.

"Owing to the presence of the fumes of chlorine it is proba-

ble that many were asphyxiated, and so died easily. Others, doubtless, were buried in ashes, like the Roman soldier in Pompeii, or were caught in some inclosed place which being surrounded by molten lava resulted in slow roasting. It is indeed a horrible disaster, and one which we may well pray not to see duplicated. Science, however, has no means of knowing that it may not occur again."

S. F. Smith, a lumber merchant known throughout Worcester county, Massachusetts, returned from a visit at St. Pierre, Martinique. He was one of the last visitors to the island from this part of the country, and his memories of the beautiful city which was wiped out of existence in a flash by Mont Pelée volcano, were only made more vivid in his mind by the disaster. With a party of eighty, Mr. Smith left New York, February 8th, on the Quebec Steamship Company's Madiana. In this party was Mrs. Sheldon, formerly Miss Bessie Mitchell, at one time a teacher in the Barre, Mass., high school.

LITTLE BOATS VISIT THE STEAMER.

St. Pierre, Martinique, was reached early on the morning of February 17th. At St. Pierre, Mr. Smith found that the vessel could only get within about a mile of the shore, and the natives in crude little boats came out to the steamer. The boats were some seven feet long, made of anything, and leaked badly. To propel the frail craft two boards were used, and the boatman sent it through the water by the dog-paddle motion. In speaking of the men and boys, Mr. Smith said he never saw such expert swimmers.

A nickel thrown over the steamer's edge would call for a rush by the rabble of boys and men, and a long dive under the boat which drew twenty feet of water was hardly out of the ordinary for the natives. When a coin was thrown into the water there was a wild rush for it.

The water was so clear that the scramble for the coin fifteen feet or more below the surface was easily seen by the passengers, and in some cases Mr. Smith said that two natives could be seen

pulling each other's hair trying to get the coin at the bottom of the harbor.

In telling of St. Pierre Mr. Smith stated that his first and best memory of the city was that here he got his best dinner of the trip, that was not served on board ship. A full course French dinner, up one flight, in a hotel that bore the name "Icehouse," was served by men waiters. Anything that was wanted in the way of liquors was served. Mr. Smith said wine seemed to be the beverage that was used by the better class of people.

Speaking of the city itself he said that it was very closely settled, but he thought the estimate of the number of inhabitants as given for the city was correct. The poorer class of people lived in one story houses, while those of more wealth lived up one flight.

AS IN SOME EUROPEAN CITIES.

The city being situated at the foot of the volcano, which is some five miles away and very steep, had three good streets, which ran parallel to the seashore. The other streets were so steep that a team with a load could not go up them. Along the coast there was a primitive car line which ran at any time. This went into the city. It was of a very narrow gauge, and when in the city ran very close to the sidewalk. When nearing a crosswalk the driver, with a horn much the same as our fishhorn, gave forth a blast that was startling.

There were two modern things about the city. It was lighted by electricity and had a modern theatre. In regard to buildings there were few imposing structures. The cathedral, large and massive, was very noticeable. In regard to schools Mr. Smith only saw one; this was a school that from the outside of the building looked to the passerby as nothing but a common dwelling. It was attended by scholars from 10 to 18 years of age. Mr. Smith thought it was a higher grade school. The noticeable fact was that nearly, if not all, the attendants were girls, and Mr. Smith said it was a matter of comment that the women and girls far outnumbered the men and boys.

The women were remarkably well formed, and their giddy

costumes were a sight in themselves. The women were very erect, due probably to the fact that nearly everything, little or big, was carried on their heads. The party that Mr. Smith was with did not go out of the city limits, but at night, over Mont Pelée there was the smoke cap. Asked if anything out of the ordinary was thought in regard to the smoke cap by the natives, Mr. Smith replied that he heard nothing said either way. On board ship it was commented that some day trouble would come, and that old Mont Pelée was not dead.

At St. Pierre one of the finest botanical gardens in the West Indies was visited by the party. One fact noticeable, especially along the shore and at the piers, was that the city was well policed. The marketplace in the morning was a place of unusual interest. Here the natives for many miles around came into the city to sell whatever they thought there was a chance to make on. Many of the natives would come many miles with bundles on their heads, weighing one hundred pounds, walking all the way.

THE TRADES PEOPLE.

The marketplace, on a small scale, was divided off, or classified; meats were sold in one part, fruits in another, and so on. Some of the more pretentious of the salespeople had a small shed to sell from, but many put their belongings down wherever it happened, and sat down beside them.

On the trip Mr. Smith and the party visited the boiling lake at Dominica. This was one of the most interesting points visited on the trip. At the shore mules and guides were hired for the trip to the lake, a distance of twelve miles. After going three miles, by placing the hand to the ground the heat below could be felt. And Mr. Smith said over a large territory small streams of steam could be seen issuing forth from three to fifteen feet in height. In places along the route a rumble and a roar could be heard like that a large river makes in going over rapids.

Reaching the lake the heat was hardly more intense than at some of the places along the route. The water in the lake was warm, and there was a heavy ripple, from which the name boiling

lake is obtained. Mr. Smith said that a few months before a traveller and his guide in going over the route broke through the crust and were killed.

The trip covered thirty-six days, a voyage through the Windward Islands to Georgetown, Demerara, British Guiana. Several side trips were taken by some of the party. Mr. Smith was one of a party of four to take a carriage drive of eighty-three miles across Porto Rico. Also at Georgetown, Demerara, a small steamer was taken for a trip of seventy-five miles up the Demerara river. Then a ride on a primitive railroad to Essequibo river was taken, the boundary line between British Guiana and Venezuela.

No greater cataclysm is authoritatively known in the annals of civilized man than that which has swept the Lesser Antilles, with Martinique's now famous volcano of Mont Pelée in the lead. But the influences of romance and of romantic history still cast a mournful glory about Mount Vesuvius and that eruption which engulfed the classical cities of Pompeii and Herculaneum and made it the most vivid and appalling of all the greater catastrophes of nature.

BEAUTY DESTROYED FOREVER.

We can transport ourselves in imagination more easily to the Bay of Naples, in the latter part of the first century of the Christian era, than to the Bay of St. Pierre in the beginning of the twentieth, for all the resources of the imagination are instantly called into play. It was the most purely pictorial era which the world has ever known.

The catastrophe then enacted on the shores of the Mediterranean had a setting of physical and artistic beauty such as have never since been conjoined in so great a measure. The Mediterranean and the Bay of Naples are still extant indeed. So is Vesuvius, in a form somewhat modified from that which was known to the Romans before the great eruption. But the architectural beauty by which man had supplemented the beauty of nature, was laid waste and has never returned in its old-time splendor.

In the year A. D. 63, the suburban city of Pompeii had

reached the climax of her prosperity. Raised to the rank of a city under Augustus, she had been recognized as a Roman colony under Nero. She had become the arsenal of the maritime cities of the Campania and the centre of their commerce. Situate on the shores of the most beautiful bay in all the world, she lay near the foot of a volcano, which had come to be considered as extinct.

For how long before the Christian era Vesuvius had been at rest is not known. This much is certain, however, that from the landing of the first Greek colony in Southern Italy, the volcano had given no signs of internal activity. Strabo, indeed, recognized it as a volcanic mountain, but Pliny did not include it in his list of active volcanoes. In those days the mountain presented a far different appearance from that which it exhibits to-day.

The huge cone, in which the steaming mass now culminates, and the long broken wall on its left, which at the present day form features so conspicuous and so peculiar, were not then to be seen. Instead there was a broad and almost level crest at nearly the same elevation, whereon a slight depression marked the place of an ancient crater. The fertile slopes of the mountain were well cultivated. Near its base lay not only Pompeii, but also the cities of Herculaneum and Stabiae.

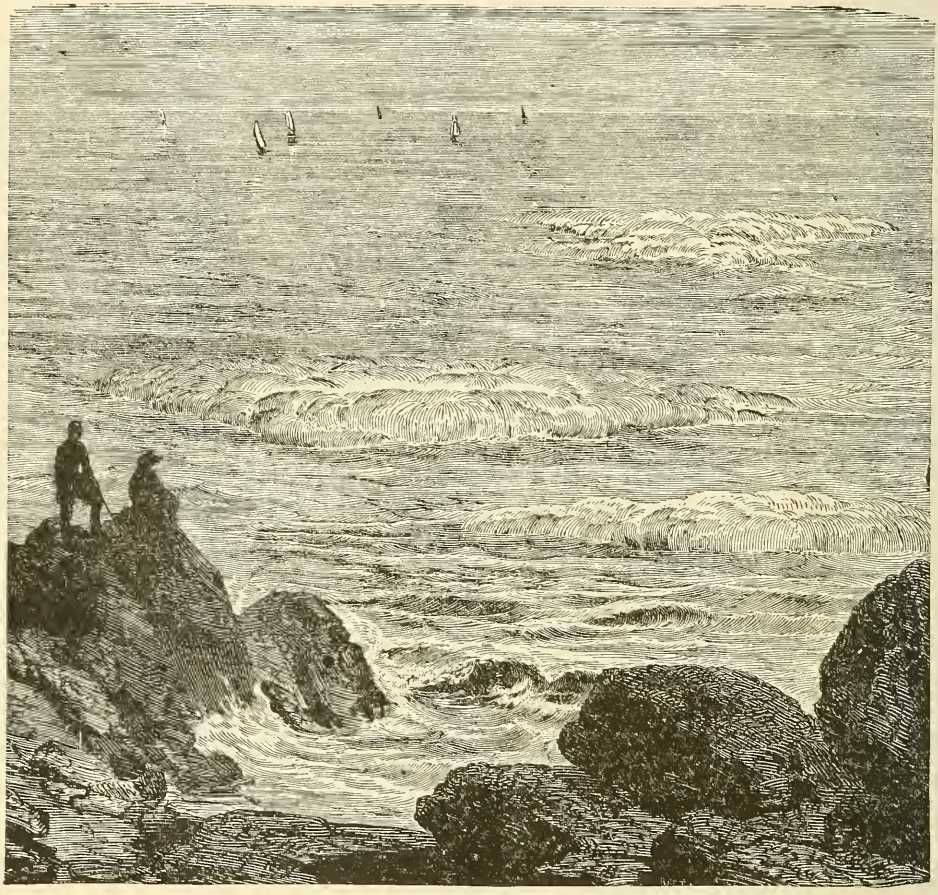
So little was the thought of danger associated with the sleeping volcano that its fiery crater not very long ago had been sought as an asylum by the bands of slaves and others who had flocked to the standard of Spartacus

REASON FOR APPREHENSION.

Although Vesuvius was at rest, an expert having only a slightly greater knowledge of natural phenomena than was current in those days would have seen reason for dread in the fact that the region of which Vesuvius was the main vent had never in the memory of man known any long period of absolute rest. The island of Pithecusa, known to-day as Ischia, was frequently shaken by violent convulsions. So fierce were the volcanic eruptions from its still active mountain that several Greek colonies

which had established themselves on the island were soon depopulated.

Nor were these eruptions the only source of peril. Poisonous exhalations, such as are emitted by violent craters after an erup-



STARTLING EFFECT OF THE ERUPTION OF VESUVIUS ON THE SEA.

tion has subsided, were exhaled at intervals from extensive tracts on Pithecusa, making the island periodically uninhabitable.

Still nearer to Vesuvius lay the famous Lake Avernus. The very name has passed into a popular synonym for the infernal regions. It is said to be a corruption from the Greek Aornos, or "birdless," and to have signified that the vapors ascending from

its waters destroyed all birds that attempted to fly over the surface.

In fact, though the lake is inocuous to-day, there is every reason to believe that it hides the outlet of an extinct volcano and that long after the volcano ceased to be active it emitted gases as fatal to animal life as those suffocating vapors which annihilated all the cattle on the Island of Lancerote, in the Canaries, in the year 1730.

After untold years in which Vesuvius had for a while resigned its pretensions as the principal vent of the great Neapolitan volcanic system, the sleeping giant gave warning of a sudden awakening. A violent convulsion of the earth occurred around its base. Many lives were lost. Much injury was done to the cities of Pompeii and Herculaneum, and most of the inhabitants fled in affright. Some never returned. The majority, however, regained courage when these preliminary stirrings had subsided and went back to their homes, but never to enjoy the same immunity from fear.

PERIODICAL EARTHQUAKES.

For sixteen years thereafter earthquakes were of periodical occurrence. These grew gradually more and more violent. But the obstruction which had so long impeded the ejection of the confined matter was not readily removed. It was not until the memorable August of 79 A. D. that the superincumbent mass, after numerous and violent internal throes, was at length hurled forth.

Of the extraordinary catastrophe which resulted we have an excellent account in a letter written by an eyewitness, Pliny the younger, to his friend Tacitus the younger. Tacitus had asked for an account of the death of the elder Pliny, uncle of the younger, who had perished in his eagerness to obtain a nearer view of the dreadful phenomenon. This afforded the nephew an opportunity of detailing all the circumstances from the beginning.

In that fateful August, we learn, both the Plinys, with the lady who was respectively sister and mother to them, were at Misenum, a seaport near Pompeii, where the elder Pliny was in charge of the Roman fleet.

"On the 24th day of August," says the younger Pliny, "about one in the afternoon, my mother desired him to observe a cloud of very extraordinary size and shape. He arose at once and went out upon a height whence he might more distinctly view this strange phenomenon.

"It was not at this distance discernible from what mountain the cloud issued, but it was found afterward that it came from Vesuvius. I cannot find a more exact description of the figure than by comparing it to that of a pine tree, for it shot up to great height in the form of a trunk, which extended itself at the top into a sort of branches, occasioned, I suppose, either by a sudden gust of air which impelled it, whose force decreased as it advanced upward, or else the cloud itself, being pressed back by its own weight, expanded in this manner. The cloud appeared sometimes bright, at others dark and spotted, as it was more or less impregnated with earth and cinders."

OLD MAN SET OUT ALONE.

Pliny's curiosity was aroused. He ordered a small vessel to be prepared that he might sail closer. The nephew, however, could not be aroused to any similar interest. He was too deep in his studies to be disturbed, so the old gentleman set out alone. It soon became evident that the phenomenon was an unusual and most threatening one. Pliny gave orders that several galleys should accompany his vessel and steered the little flotilla to the foot of Mount Vesuvius, "for the villas stood extremely thick upon that lovely coast." As they approached cinders, pumice stone and black fragments of burning rock fell on and around the ships.

"They were in danger, too, of running aground, owing to the sudden retreat of the sea; vast fragments also rolled down from the mountain and obstructed all the shore."

The pilot advised retreat. Pliny would not hear of it. "Fortune befriends the brave," he cried and ordered the ships press onward to Stabiao. Here he did his best to encourage his friends whom he found in great consternation, assured them that

the flames which they saw in several places were merely burning villages, and after eating supper, retired calmly to rest.

"Being pretty fat," says his nephew, "and breathing hard, those who attended outside actually heard him snore."

But now the court outside the house was almost filled up with stones and ashes. The house itself rocked and swayed. Pliny was incontinently aroused from his slumbers. Joining the rest of the company he found them planning to make a sortie. They decided on seeking the fields for safety.

Fastening pillows on their heads as a protection from falling stones, they advanced in the midst of an obscurity greater than that of the darkest day—though beyond the limits of the great cloud it was already broad day. When they reached the shore, they found the waves running so high that they dared not venture out to sea. So Pliny calmly resumed his nap.

SULPHUROUS VAPORS.

"Having drunk a draught or two of cold water, he lay down on a cloth that was spread out for him; but at this moment the flames and sulphurous vapors dispersed the rest of the company, and obliged him to rise. Assisted by two of his servants, he got upon his feet, but instantly fell down dead, suffocated, I suppose, by some gross and noxious vapor, for he always had weak lungs and suffered from a difficulty of breathing."

Meanwhile the nephew was still in Misenum. Even here there was danger, although Vesuvius was no less than fourteen miles away. The land rocked like the sea. The sea itself broke and ebbed and flowed on the coast in tides as novel as they were eccentric. Explosion succeeded explosion, roar followed roar from the top of the mountain.

This had now disappeared behind a black and ominous cloud, bursting with ominous vapors, whence came intermittent, but dazzling flashes of lightning. The light of the afternoon faded as the murky pall spread further from its center, and enveloped Misenum and the island of Capraae in a common gloom.

When the sun had set the cloud which veiled the summit was

lit up, not only with the intermittent tongues of flame, but also with a continuous ruddy glow, as from some vast, hidden furnace, while a hail of projectiles fell fast and furious down the sides of the mountain.

So passed the night; then came the hour of dawn, but not the light of day. This, we are told, even at far away Misenum was "exceedingly faint and languid." Not yet were the terrors of the eruption at an end. The level ground near Misenum, whereon the fugitives from the shaken houses had gathered, rocked to and fro. The sea rolled back from the land, leaving the shores strewn with many marine animals. The cloud that rested on Vesuvius became more and more murky, and then seemed to be riven by darting sheets of flame.

Again it came sweeping across the bay. It was blacker than any night, "like the blackness of a room shut up." On every side "nothing was to be heard but the shrieks of women and children and the crying and shouting of men."

ANOTHER OUTBURST OF FLAMES.

At length a light appeared, which was not, however, the day, but the forerunner of another outburst of flames. These presently disappeared, and again a thick darkness enveloped everything. Ashes fell heavily upon the fugitives, so that they were in danger of being crushed and buried in the thick layer that covered the whole country.

Many hours passed before the dreadful darkness began slowly to dissipate. When at length day returned and the sun even was seen faintly shining through the overhanging canopy every object seen changed, being covered over with white ashes as with a deep snow.

Pliny says nothing in his letter of the destruction of the two populous and important cities. He tells us that at Stabiae a shower of ashes fell so heavily that several days before the end of the eruption the court leading to the elder Pliny's room was beginning to be filled up. When the eruption ceased Stabiae was completely overwhelmed.

Far more sudden, however, was the destruction of Pompeii and Herculaneum.

The two cities were first shaken violently by the throes of the disturbed mountain. It is probable that the inhabitants were driven by these anticipatory throes to fly from the doomed towns. For notwithstanding Dion Cassius, who wrote more than a century after the catastrophe and who reports that the two cities were buried under showers of ashes "while all the people were sitting in the theatre," we now from the evidence furnished by the excavations that none of the people were destroyed in the theatres, and, indeed, that there were very few who did not escape from both cities. Dion Cassius doubtless obtained the material for his accounts from the traditions of the descendants of survivors, and he shows how terrible was the impression made upon their minds.

He assures us that during the eruption a multitude of men of superhuman stature appeared, sometimes on the mountain and sometimes in the environs, that stones and smoke were thrown out, the sun was hidden and then the giants seemed to rise again, while the sounds of trumpets were heard.

In the superstitions of the Middle Ages Vesuvius assumed the character which had before been given to Avernus, and was regarded as the mouth of hell. Cardinal Damiano, in a letter to Pope Nicholas II., written about the year 1060, tells the story of how a priest, who had left his mother ill at Beneventum, passed on his way homeward to Naples by the crater of Vesuvius, and heard issuing therefrom the voice of his mother in great agony. He afterwards found that her death coincided exactly with the time at which he had heard her voice.

VESUVIUS CONTINUED ITS ACTIVITY.

The phase of activity on which Vesuvius entered in the first century has continued ever since. During the next fifteen hundred years eruptions were of occasional occurrence, though of no great magnitude. Throughout the long intervals when Vesuvius was at rest it was noted that Ætna and Ischia were more or less disturbed.

In 1538 a startling evidence was given that there was no decline of energy in the volcanic system of Southern Italy. This was the sudden birth of the mountain still known as Monte Nuovo, or New Mountain, which was thrown up in the Campania near Avernus, on the spot formerly occupied by the Lucrine Lake.

For about two years prior to this event the district had been disturbed by earthquakes, which on September 27 and 28, 1538, became almost continuous. The low shore was slightly elevated, so that the sea retreated, leaving bare a strip about two hundred feet in width. The surface cracked, steam escaped, and at last, early on the morning of the 29th, a great rent was made, from which were vomited furiously "smoke, fire, stones and mud composed of ashes, making at the time of its opening a noise like the loudest thunder."

The ejected material in less than twelve hours built the hill which has lasted substantially in the same form to our day. It is a noteworthy fact that since the formation of Monte Nuovo there has been no volcanic disturbance in any part of the Neapolitan district, save only in Vesuvius, which for five centuries previous had remained in almost complete rest.

ERUPTION IN 1631.

But Vesuvius was now to give repeated evidence that its old energy was only dormant within it. The first serious intimation was the eruption of December 16, 1631. During the last long pause a covering of rock and cinder had formed near its crater, which had supported woods and pasture lands.

The eruption blew away this covering in a trice. Seven streams of lava poured from the crater and swept rapidly down the mountainside, bringing death and destruction along their paths. Resina, Granasello and Torre del Greco, three villages that had grown up during the period of quiescence, were more or less overwhelmed by the lava torrents. It was estimated that eighteen thousand of their inhabitants were killed.

What made the horror all the greater was a frightful error of judgment, which has just been repeated at St. Pierre. The Gov-

ernor of Torre del Greco had refused to be warned in time and prevented the people from making their escape until it was too late. Not until the lava had actually reached the walls was the order for departure given. Before the order could be acted upon the molten streams had burst through the walls into the crowded streets and overwhelmed the vast majority of the inhabitants.

Since this great convulsion Vesuvius has never been completely at rest for any long interval, though more than a century passed before the repetition of a great catastrophe in the year 1660.

LATER ERUPTIONS.

The eighteenth century was signalized by repeated eruptions. Those which occurred between 1764 and 1779 were carefully observed and recorded by Sir William Hamilton, the scientist, who was at that time British Ambassador to the Court at Naples. The most remarkable eruption in that century occurred, however, in 1793, when a lava stream from twelve to forty feet thick swept over Torre del Greco and penetrated the sea to a distance of 380 feet, by which time it had increased to 1204 feet wide and fifteen feet high.

On December 8, 1861, Torre del Greco suffered severely from another visitation. The severest eruptions in this century, however, were those of 1871 and 1876. In the first a sudden emission of lava killed twenty spectators at the mouth of the crater, and only spent its fury after San Sebastian and Massa had been well nigh annihilated.

Fragments of rocks were thrown up to the height of 4,000 feet, and the explosions were so violent that the whole countryside fled panic stricken to Naples. The activity of the volcano, accompanied by distinct shocks of earthquake, lasted for a week. In 1876, for three weeks together, lava streamed down the side of Vesuvius, sweeping away the village of Cercolo and running nearly to the sea at Ponte Maddaloni. There were then formed ten small craters within the great one. But these were united by a later eruption in 1888, and pressure from beneath formed a vast cone where they had been.

It may seem strange that so dangerous a neighborhood should be inhabited. But so it is. Though Pompeii, Herculaneum and Stabiae lie buried beneath the lava and the ashes belched out of the mouth of Vesuvius, the villages of Portici and Revina, Torre del Greco and Torre del Annunziata have taken their place, and a large population, cheerful and prosperous, flourishes around the disturbed mountain and over the district of which it is the somewhat untrustworthy safety-valve.

Probably the most dangerous railway in the world is that up the side of Mt. Vesuvius. The lower terminus is from the end of the carriage road; the upper about a thousand feet from the crater. The railway carries about five hundred passengers weekly; but the natural conditions under which it is maintained make it difficult and uncertain of operation, the streams of lava and the clouds of ashes and cinders often obstructing and wrecking the track.

The tourist who ascends Vesuvius does so at the risk of his life. It is said that 11,000 tourists have been killed since it has become a fad to make the ascent of the volcano. Formerly the trip was made on foot or horseback, and these methods are still used to a certain extent. The fact that the central cone of Vesuvius collapsed early in 1902, and that long and deep cracks have made their appearance, gives rise to reasonable belief that startling volcanic disturbances are imminent. Strange as it may seem the region is very fertile, and wine-growing is an important industry.

COPYRIGHT, 1902, BY J. MARTIN MILLER

SCENE OF DESTRUCTION IN THE NORTHERN PART OF ST. PIERRE AFTER THE FIRST ERUPTION

THE SHATTERED FOUNDATION OF THE LIGHTHOUSE IS SEEN AND A PART OF THE SPIRAL STAIRCASE OF THE TOWER

COPYRIGHT, 1902, BY J. MARTIN MILLER

MUD, STONES AND LAVA EMITTED BY MOUNT PELEE

WATERFALL, NEAR ST. PIERRE, MARTINIQUE

GROUP OF COOLIES, ISLAND OF MARTINIQUE

KINGSTOWN, ST. VINCENT, SHOWING VOLCANO IN THE DISTANCE

SCENE OF DESOLATION IN THE ISLAND OF ST. VINCENT, NEAR KINGSTOWN

BIRD'S-EYE VIEW OF NAPLES SHOWING MOUNT VESUVIUS IN THE DISTANCE

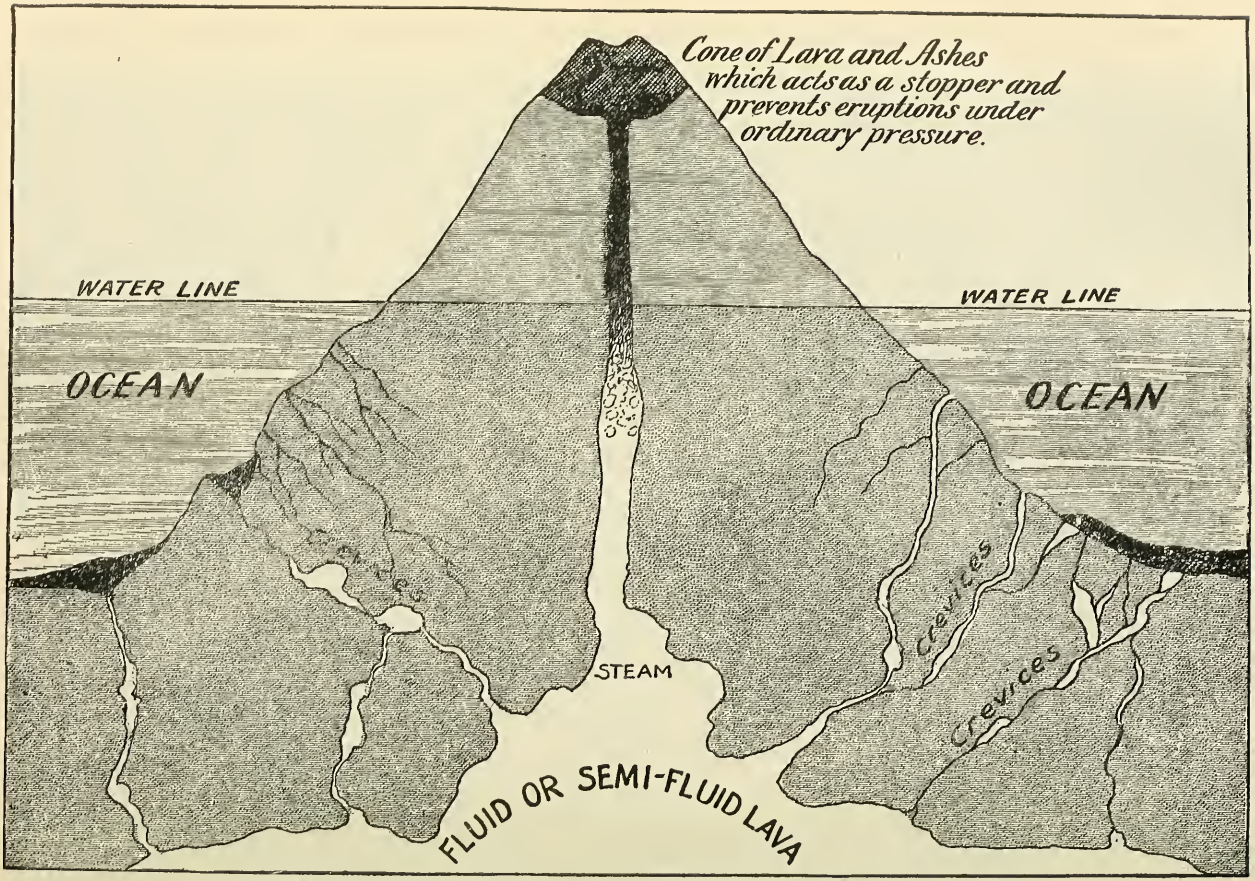


DIAGRAM SHOWING HOW VOLCANIC ERUPTIONS ARE PRODUCED

WATER COMING IN CONTACT WITH MOLTEN LAVA IN THE VOLCANO'S INTERIOR GENERATES STEAM AND CAUSES AN EXPLOSION AS STEAM DOES IN A WEAK BOILER

CHAPTER XII.

MARTINIQUE UNDER A MANTLE OF DARKNESS.—LIFE ON THE ISLAND ALMOST UNENDURABLE.—EXTREME SUFFERINGS OF THE REFUGEES.—FAMINE AND DISEASE RAVAGING ST. VINCENT.

THE situation at Fort-de-France on May 19th may be inferred from reports of eye-witnesses. One of these described the latest aspects of the disaster as follows:

"Alarm continues to fill the island, although no serious eruption has occurred since Mont Pelée, on May 8th, destroyed the city of St. Pierre. The volcano threatens further destruction every day, and there are many who believe that an explosion even more serious than that already recorded will mark the culmination of the activity of Pelée.

"Ashes were spouted in great clouds from the crater all day on May 18th. The explosion began in the early morning, when a black column rose above Mont Pelée, accompanied by internal rumblings and a tremor of the earth that sent the sea back from the land in powerful waves. This column was first caught by a current of air that carried in northward. Then an upper air current swept it back in the opposite direction. Thus it made an immense and well formed 'T,' the base of which rested in a cup of flame on the crest of the volcano, from which it sprang.

"Then the wind veered, and a mantle of darkness was swept westward across the island, enveloping Fort-de-France, upon which volcanic dust fell to a depth of more than an inch and a half. So heavy was the dust that filled the air that respiration became a labor, and a fear of suffocation came upon the inhabitants. Great alarm continued for more than four hours, and it was not until the cloud of ashes blew out to sea, early in the evening, that confidence was restored.

"All last night the summit of Mont Pelée had the appearance of a gigantic blast furnace, at which great forces were working.

Flames shot skyward in sheets that at times lighted up the entire island. For a few minutes the fires would drop back into the mouth of the crater, only to reissue with redoubled force. These flames continue to stream from the crater, and with so great force that they are visible from St. Marie, a village in the extreme north of the island. The atmosphere is full of dust and the heat is terrific. Life on the island is all but unbearable, and the suffering of the refugees who continue to crowd into Fort-de-France is extreme.

"Rain fell to-day for the first time in a fortnight. This long drouth, and the fact that the grass has been buried under a layer of ashes, has made it particularly difficult to obtain fodder for horses and cattle, which are dying in unprecedented numbers. Notwithstanding the rain, the temperature registers 100 degrees Fahrenheit, a mark from which it has receded only during the fall of rain since very early in the morning.

SEVERE MEASURES TO STOP LOOTING.

"Despite the precautions taken by the authorities, looting continues in the north of the island, though it practically has been stopped in St. Pierre. In the country many houses have been robbed and burned. Soldiers have been sent out with instructions to take severe measures, if necessary, to put a stop to the disorders. In Fort-de-France supplies are being dealt out to the refugees by the authorities. A committee has been formed to investigate all applications for relief, so that those unworthy shall not impose upon the generous.

"Martinique mails, forwarded from Paris just prior to the disaster, arrived on May 18th. The newspapers print a number of private letters from St. Pierre, giving many details of events immediately preceding the catastrophe. The most interesting of these is a letter from a young lady, who was among the victims, dated May 3d. After describing the aspect of St. Pierre before dawn, the town being lit up with flames from the volcano, everything covered with ashes and the people greatly excited, yet not panic stricken, she said:

"'My calmness astonishes me. I am awaiting the event tranquilly. My only suffering is from the dust, which penetrates everywhere, even through closed windows and doors. We are all calm. Mamma is not a bit anxious. Edith alone is frightened. If death awaits us, there will be a numerous company to leave the world. Will it be by fire or asphyxia? You will have our last thoughts. Tell brother Robert that we are still alive. This will, perhaps, be no longer true when this letter reaches you.'

"The Edith mentioned was a lady visitor who was among the rescued. This and other letters enclosed samples of the ashes which fell over the doomed town. The ashes are a bluish-gray impalpable powder, resembling newly ground flour and slightly smelling of sulphur.

"Another letter, written during the afternoon of May 3, says: 'The population of the neighborhood of the mountain is flocking to the city. Business is suspended, the inhabitants are panic-stricken and the firemen are sprinkling the streets and roofs to settle the ashes, which are filling the air.'

WARNINGS FOR MANY DAYS.

"These and other letters seem to indicate that evidences of the impending disaster were numerous five days before it occurred. It is difficult to understand how it was that a general exodus of the population of St. Pierre did not take place before May 8.

"Still another letter says: 'St. Pierre presents an aspect unknown to the natives. It is a city sprinkled with gray snow, a winter scene without cold. The inhabitants of the neighborhood are abandoning their houses, villas and cottages and are flocking to the city. It is a curious pell-mell of women, children and bare-footed peasants, big, black fellows, loaded with household goods. The air is oppressive; your nose burns. Are we going to die asphyxiated? What has to-morrow in store for us? A flow of lava, rain of stones, or a cataclysm from the sea? Who can tell? Will give you my last thought if I must die.'

"A St. Pierre paper of May 3 announces that an excursion

arranged for the next day to Mont Pelée had been postponed, as the crater was inaccessible, adding that notice would be issued when the excursion would take place.

"Governor L'Huerre, of Martinique, has cabled to the Colonial Minister, M. Decrais, at Paris, announcing that Mont Pelée continues to throw up immense quantities of cinders, which, owing to a change in the direction of the wind, are now covering the southern districts of the island. Violent explosions have been heard at Le Carbet. The Governor further declared there is no danger of an outbreak on the part of the population of the northern districts of the island, as alleged, in consequence of the people being out of work.

AMPLE SUPPLIES EXPECTED.

"The Governor reports, under date of Fort-de-France, May 18:

"'I have informed the population that supplies by the United States naval vessel Dixie and the steamers Fontabella and Madiana will arrive here to-day. The cargoes of these vessels will be exempted from all duties and other charges. This is done on all food supplies reaching us. Commander G. W. Mentz and Captain Crabb, of the Quartermaster's Department, have just arrived on the United States collier Sterling, with the food presented by the Government of Porto Rico.'

"The Ministry of the Colonies totally discredits the report of the destruction of Sainte Marie, Martinique, by fire, which has reached here, as despatches do not mention the fact, which they certainly would have done if the town had been burned.

"The congregation completely filled the fashionable Church of St. Augustine on the occasion of the solemn service organized by the League of French Women in memory of the victims of the Martinique disaster. Bishop Cormon celebrated Mass and pronounced the absolution. This was the first memorial service for the dead of Martinique held in Paris.

"The officials say the reports of the French Embassies and Legations at the various capitals show that the sympathy with France abroad is increasing. The latest royal subscription is that

of the Queen Regent of Spain, who has given 10,000 francs to the fund, which now amounts to over 750,000 francs.

"Acting Governor L'Huerre and the other insular authorities, and the committee of doctors appointed, who embarked on the French cruiser Suchet at Fort-de-France, proceeded on that ship to St. Pierre, to determine whether there was any danger in permitting the examinations of the ruins to continue, inasmuch as a number of the corpses buried there are in a state of putrefaction.

"As the authorities were about to debark at St. Pierre, a large quantity of lava flowed into the Riviere Blanche, accompanied by an enormous cloud of smoke. The party did not land, and the Suchet steamed to the north. In the direction of La Precheur the appearance of the volcano was not so terrifying.

SUPPLIES LANDED AT BASSE POINTE.

"After the cruiser passed Cape Ste. Marie, the cinders on shore were seen to be less thick, and gradually decreased as the vessel approached Basse Pointe. Here the Suchet anchored, and a small boat came out from the shore, bearing persons who asked for food. Thirty-eight barrels of biscuit and eight hogsheads of codfish were distributed. There are 600 inhabitants at Basse Pointe, and a number of families have fled the village, leaving all their property behind. The river at Basse Pointe is filled with mud, which appears to be congealing. The bridge there has been completely destroyed. The river water has ceased to flow, but cattle get water from springs in the neighborhood. There are several very fine sugar cane estates in the vicinity of Basse Pointe.

"Several women, with their children and baggage, embarked on the Suchet there, and the cruiser returned to St. Pierre. The return trip was quite difficult, as the coasts were at times hidden from view.

"Upon reaching St. Pierre the second time, the Government authorities landed. There was a strong odor of burnt flesh in the town, and flies were beginning to congregate there in great

numbers. Difficulty is had in burning the bodies. The committee of doctors examined the ruins and declared that in some parts of the town it would be impossible to let the work of excavation continue. Access to St. Pierre is difficult. The town is surrounded by thick clouds of cinders and vapor, and at times it is impossible to see more than six feet.

"Cinders are also falling at Fort-de-France, and the population became alarmed, but it is now more quiet. Toward five o'clock in the evening breathing becomes quite difficult, and horses show signs of disquietude. The United States cruiser Cincinnati and the Government tug Potomac are at Fort-de-France."

SUBSCRIPTIONS SUSPENDED.

The following statement was given out at the White House, May 19th:

"On Saturday, the 19th, immediately on receiving Consul Ayme's despatch, the President directed the Secretaries of War and the Navy to inquire and report as to the true condition of affairs in Martinique and St. Vincent. These reports will be made public as soon as received. All supplies and all the money subscribed hitherto have been urgently needed, but until further information is received it is deemed best that the receipt of subscriptions be suspended."

Secretary Hay received the following cablegram from United States Consul S. A. MacAllister, at Barbados, West Indies, dated the 19th: "Sixteen hundred deaths at St. Vincent; 4000 destitute. Immediate wants supplied. Aid needed for six months. This is authentic."

The Navy Department received the following despatch from Commander McLean, of the Cincinnati: "Fort-de-France, May 19th.—Water barge not needed. Ashes and volcanic dust falling thickly here; now like thick fog; decks covered."

The Potomac was reported to have reached St. Lucia Saturday, the 17th.

Cornelius N. Bliss, National Treasurer of the West Indies relief fund had received up to noon on May 19th a total of

$94,000. Gustav H. Schwab presided at a meeting of the Executive Committee of the Associated Relief Committees of New York, and presented the following cablegram, received by the New York Chamber of Commerce from the Chamber of Commerce, Barbados: "Ascertained conditions at St. Vincent. Damage, $250,000, 1600 deaths, 160 wounded in hospitals, 4000 destitute. Immediate wants supplied, but help required for the next six months."

The following reply was sent: "Chamber of Commerce, Barbados: Cable received. Our agent on way to island authorized to assist."

The Mansion House West Indian relief fund now aggregated $125,000 on May 19th. Lord Salisbury, contributed $500, Lord Strathcona and Mount Royal, the Canadian High Commissioner, $2500, Lady Strathcona and Mount Royal $1000, Wernher, Beit & Co., the South African mining concern, $25,000, and "Anonymous," per Joseph Chamberlain, the Colonial Secretary, $500.

BRITISH CRUISER LANDS SUPPLIES.

The following is a despatch from Fort-de-France, Island of Martinique, May 19th:

"A party from here has gone to St. Pierre on the British cruiser Indefatigable, carrying with them coffins, for the purpose of recovering the bodies of the family of Thomas T. Prentis, the late United States Consul at that place, who were killed in the disaster. The interment of the remains will take place here and will be conducted with military honors. The Indefatigable brought 120 tons of supplies.

"There was another eruption from Mont Pelée yesterday. Ashes fell here. The volcano is still violently smoking, and there are no signs of its ceasing its activity.

"The United States cruiser Cincinnati and the United States Government tug Potomac will be stationed here immediately. The Potomac will shortly go to the island of Guadeloupe to bring to this place the furniture, books, etc., of the office of the United States Consul there, Louis H. Ayme."

Another ominous despatch came from St. Kitts, B. W. I., May 19:

"As the full extent of the disaster worked in St. Vincent by the explosion of Soufriere becomes known the horror is increased. Conditions there grow worse day by day, notwithstanding the fact that the volcano apparently has returned to its state of passivity. The island is famine-stricken, notwithstanding the fact that supplies have been sent in from all of the other British West Indian Islands. Disease has appeared, and there are not enough physicians present to give the required relief.

"Life in St. Vincent is made almost impossible by the sickening stench that gives the entire island a resemblance to neglected shambles. Everywhere noxious vapors are wafted by the torrid winds that seem to be not in the least tempered by the surrounding waters. These conditions are bad enough in the southern part of the island, about Kingstown, but they are multiplied a thousand times in the Carib country about Soufriere and at Georgetown.

TWENTY-TWO HUNDRED WERE KILLED.

"Under the direction of the Government, interment has been given to 1800 bodies, but other hundreds lie, decomposing, under the tropical sun. The official estimate of the victims of the volcano has now been increased to 2200. That means that at least 400 bodies are unburied.

"But that is the least of the trouble. Thus far no effort has been made to do more than care for the living and bury the dead. All about are dead cattle, polluting the atmosphere, which already is heavily laden with disease. In one of the ravines near Morne Garou the bodies of eighty-seven Carib Indians were found heaped together. Not far away are the carcasses of hundreds of cattle.

"It has now been ordered that these menaces to life be removed. Quicklime is being used to destroy the bodies. Fires are burning over the district which was laid in waste by the Soufriere, and in these are to be thrust the carcasses of the dead cattle.

"Eruptions have ceased. Soufriere is as quiet as it was before the explosions of ten days ago. Arrangements are being made for exploration of the new craters. Local scientists believe that the forces which were pent up within the earth have been so relieved that there is no longer danger of eruptions, and the refugees in Georgetown and Kingstown are being encouraged to return to their homes in the country. Above the Soufriere hangs a cloud of sulphurous gas, but the rumblings have entirely ceased, and no ashes or lava have been put forth for four days.

"It has been estimated by the Government that the losses from the destruction of produce, growing crops and live stock will aggregate $300,000. There will be no sugar or arrowroot produced in the island this year.

"In the hospital there are now 140 patients, all suffering from burns or from the effect of inhaling suffocating gases. Supplies are being given out daily to more than 4000 refugees. It is planned that Government loans will be made to such as are able to resume work upon estates, and as soon as possible the island will be returned to its self-supporting state. It is not desired that charity be accepted to any greater extent than is absolutely required."

COMMENTS BY A LEADING JOURNAL.

"By the prompt action of the Chamber of Commerce of New York in buying the cargo of a ship on her way to Martinique, relief will be given to the refugees at Fort-de-France almost immediately. The vessel is due to arrive there on Saturday, the 17th of May, and instructions have been sent to her captain by cable to turn over the bulk of the cargo to the relief authorities. The assistance sent from the other islands of the West Indies will serve to tide over the strain upon the resources of Fort-de-France until the arrival of this vessel, and immense supplies have been carried by the Dixie which should reach Martinique soon.

"It is reasonable to conclude, therefore, that the immediate needs of the sufferers will be met as well as they can be, and the attention of the relief committees appointed by President Roose-

velt, as well as of local organizations formed for the same purpose, can be directed to maintaining the succor while they perfect plans for organized relief.

"For the time being supplies must be sent without regard to expense or the danger of having them diverted from their intended purpose. But experience with such disasters tells us that just as thieves promptly appeared upon the yet smoking ruins of St. Pierre for the purpose of robbing the dead, so also thieves of another kind will try to take advantage of the charitable instincts of humanity and obtain for their personal use the money and supplies so freely given to aid those in real want and distress. It is the duty of those in charge of the relief funds to see that every dollar contributed to those funds shall go to those who have suffered directly or indirectly from the volcanic eruptions, and not to other people.

ACCOUNT BY A SERVANT GIRL.

"According to a despatch from Fort-de-France, a servant girl was taken from the ruins, who, though fatally injured, was conscious and able to give a slight account of the great convulsion of nature. That it came without any special warning may be inferred from her statement that she was attending to her ordinary household duties when a terrific explosion so frightened her that she fainted. While in this condition she was badly burned. Recovering consciousness, she saw two members of the household in which she was employed in a similar condition. They died of their injuries, and the servant relapsed into unconsciousness. She could tell nothing more, and died soon after being taken to the hospital at Fort-de-France.

"Brief as is this recital, it shows that the volcanic explosion was instantaneous, and that the inhabitants of the city were at once overwhelmed by fire, so that they had no opportunity to escape. It also indicates that some of them, at least, were not instantly killed, but probably suffered an agonizing death from burns.

"Although every one in St. Pierre at the time of the catastrophe, except one prisoner in jail, appears to have perished, a few

in the suburbs of the city and in outlying towns on the northern end of the island escaped, and are now being cared for in Fort-de-France. It is for these survivors and others on the island who have been deprived of means of support that help is needed."

AMERICAN GENEROSITY.

Later the United States consul at Fort-de-France cabled that the needs of the Martinique sufferers would be satisfied with the supplies already afloat and that there was no occasion for further subscription. If he was right in his estimate of the situation and the volcanoes do not renew their work of desolation the demand on the generosity of the world has been met and the survivors of the Martinique and St. Vincent calamity can be left to their own resources.

Nothing could be finer than the response which the people of this country made to the cry for help from Martinique and St. Vincent. The prompt action of the Government at Washington, in which it led all the world, was reflected by private beneficence all over the country. Other Governments might hesitate and look for a precedent. Other people might remain inert and unresponsive before the great calamity which overtook many thousands of human beings in the West Indies.

This is not the American habit. In the presence of great misfortune and human distress Americans see a duty before them to relieve that distress and mitigate the calamity to that extent at least. This has come to be a fixed principle ingrained in their nature, so the news of great misfortune and corresponding distress is met by subscriptions before there is time even for relief organization and appeals for aid.

The American response to the West Indian calamity illustrated this in a striking manner. Donations came in an uninterrupted stream of magnificent proportions from every quarter. This is as it should be. There is little danger of the Consul being troubled with an embarrassment of riches through the excessive liberality of the people. If the relief organization shall receive more money than is required for the present need

no harm can come of it. The money can be kept for another emergency.

Philadelphia has seen the benefit of a Permanent Relief Association, with funds ready on the instant when a great calamity calls for immediate aid. If out of this mighty West Indian tragedy the nucleus of a permanent national relief fund should be established a residuum of good will be left out of this great misfortune.

Americans have been charged with being controlled by a commercial spirit and devoted to the worship of the almighty dollar. Americans are willing to hustle, to toil, to risk much to get that dollar, but they get it to use it, and they have never insisted on using it exclusively on themselves. It is because they get it that they are able to give it. That they are willing to give it to alleviate distress promptly, liberally, without prodding or prompting or waiting to see what others will do, shows that this spirit of commercialism in the acquisition of wealth gives place to the spirit of the good Samaritan in its disposition.

LESSON FOR THE PESSIMIST.

The pessimist who likes to regard the past as much better than the present will find no confirmation of this view in the manner in which the world has responded to the need of relief of the West India islanders, stricken by the volcanic convulsions at Martinique and St. Vincent. We say "the world" because, while most of the aid was tendered from this country, as there was great urgency and since from here it would be most promptly available, yet Americans have done only what any generous, self-confident and prosperous nation ought to have done, if situated as we are.

Europe, too, has manifested its deep concern for these sufferers, though belonging to a different hemisphere, and individual gifts from the Kaiser, King Edward, and others in high and low position alike have shown the strength of the fellow-feeling that, when the history of the matter shall be reviewed, will be found, without doubt, to have been universal. If there is anything to be regretted in this connection, it is that France and England

have seemed to display less practical interest in their own colonies than we have.

It is not surprising, however, that the immediate sympathetic shock of the double cateclysm should have been heavier here than in Europe, or even in the nearer Spanish-American states, where news is disseminated less quickly and, owing to the more sluggish habit of the popular intellect, is grasped less readily. It is doubtful, even, if the people of the other West India islands, not in immediate proximity to Martinique and St. Vincent, realized more thoroughly than we did the greatness of the misfortune.

But in any event Americans have every right to congratulate themselves upon the celerity and efficiency of their response to a direful need, even before it had been voiced in actual appeal by its surviving victims. The pessimist can find nothing here to gratify his eternal spleen. We have given of our abundance freely and gladly, and we have given in a way to render this succor trebly welcome and many times as useful as it would have been if it had been trammeled with grudging investigation and official delays.

NO EXAMPLE TO EQUAL THIS.

There is no example in the past of such instant help on a large scale to suffering communities from others entirely foreign to them. Before the latter half of the nineteenth century it could not have happened, because, without the highly developed means of communication and transportation of the present day, it would have been a physical impossibility. But there is also the thoroughly established fact that the sense of solidarity of mankind has had a very great development and has grown much more acute within the last few decades. Wars and fightings may continue, though in lessening frequency, as we are fain to believe; but the mantle of charity is broadening, and the intelligent sentiment of world-wide co-operation for the common benefit has a deeper hold than ever before upon the hearts and intellects of men.

The next serious volcanic eruption will be from Mont Conseguina, Nicaragua, according to the prediction of Henry H. Windsor, who has made an exhaustive study of the proposed

interoceanic canal routes. Mr. Windsor, who is editor of Popular Mechanics, three years before it took place, predicted the eruption on Mont Pelée. At that time he said:

"The earth's crust cannot long withstand the strain under the Island of Martinique, and some day there is going to be an outburst from Mont Pelée that will cause devastation unequaled except in the destruction of Pompeii."

Mr. Windsor agrees with Professor Heilprin of Philadelphia, that all the islands of the West Indies and the strip of land between the continents of North and South America are in the region of weakness and may sink into the sea because of the great cavities being formed within the earth by the continued eruptions. A canal through Nicaragua, says Mr. Windsor, eventually would be destroyed by Mont Conseguina.

LAND OF CONSTANT PERIL.

"Along a valley formed by the flow of the seas of volcanic lava from opposite sides; through earth that almost continuously trembles from internal disturbances, and in the midst of volcanoes from which still spout ashes and flames, lies the route of the trans-isthmian canal," he says. "No longer ago than 1835 the inhabitants of all the surrounding country fled in terror from the disastrous eruption from the volcano of Conseguina. Earthquakes there are now of almost weekly occurrence.

"The topography of the earth which was formed there by volcanic eruptions is still undergoing radical changes of formation. New hills are made and new valleys result from the internal disturbances that seem to never cease. Should the Nicaraguan Canal be built there are grave fears that it would only be a question of time when it would be obliterated either by volcanic eruption or an earthquke.

"These volcanoes originally broke out in the bottom of the sea, and by their continuous overflow built up and added to the continent twenty-five miles. Before the formation of the volcanoes, the area which is now Lake Nicaragua was formerly a bay behind a long point projecting into the Pacific Ocean to the northwest. The

overflow from the volcanoes built up the shore until it connected with and covered the northwesterly end of this point, and this changed the bay into the present lake.

"The canal location is on the west side of the Rio Grande and Los Lajas, on the east side between Lake Nicaragua and in the gorge of the San Juan. The general plan of the topography is recent. In the territory in question are three principal mountain ranges--the Costa Rican, having peaks 10,000 and 11,000 feet high ; the Nicaraguan highlands, with peaks from 5000 to 7000 feet high ; and the west coast volcanoes. The latter reach in many instances to a height of 6000 feet. The volcanoes lie between the Nicaraguan highlands and the line of Costa Rican mountains. As is characteristic of Central America, all have a northwesterly and southeasterly trend.

"The volcanoes form a line of isolated peaks, beginning at Ometepe, in Lake Nicaragua, and ending with Conseguina, in the Gulf of Fonseca. The total length of this volcanic range is 180 miles. Ometepe and Conseguina are still smoking, occasionally ejecting ashes.

"As the lava from these many volcanoes covered the northwesterly end of the original point of land extending into the Pacific Ocean and changed the bay into the Lake of Nicaragua, so the southeasterly point was covered and built up by the flow from the Costa Rican mountains. The two flows were toward each other and did not quite join. Between these two flows is the location of the Nicaraguan Canal.

VIEW OF FRENCH EXPERT.

"The crust of the earth is extremely thin in Nicaragua, and I look for the next great eruption there. It may be more terrible than anything history has known ; like those the earth experienced prior to the age of man when mountains and continents were formed and obliterated by sinking and upheavals of the earth."

Mr. Windsor received a letter from Bunau-Varilla, the noted French engineer, which states :

"Add to the many difficulties of handling large ships, the

rapid current of the river, and the enormous discharge in flood seasons of the affluent, reaching often a total of more than 100,000 cubic feet per second, and taking into consideration, also, the violence of the winds, which blow a large part of the year through the San Juan Valley and over Lake Nicaragua, to say nothing of the volcanoes and earthquakes and their possibilities, and I have no hesitation in saying that a Nicaraguan canal probably would soon be destroyed by natural agencies, and if opened and kept open for a certain length of time would offer small inducements to ships on account of the great dangers of its navigation.

"Think of building a great dam across the San Juan Valley 140 feet from base to summit, nearly a mile in length, and in a country almost constantly disturbed by earthquakes; in a country of marked volcanic activity. Only a few years ago a volcano in the neighborhood erupted a mass of rock equal to the total volume of excavation needed for the Nicaragua Canal. It should not be forgotten that there is now an active volcano in the midst of Lake Nicaragua.

"It is not necessary to be an engineer to understand that masonary work like this, of colossal proportions and constantly subjected to the pressures of the waters, could not withstand an earthquake shock. Even if the shock were only sufficient to open a slight fissure the pressure and rush of the waters would complete the work of ruin.

"But there are grounds to believe that a volcanic eruption, more terrific than anything mankind has known, may occur in Lake Nicaragua at almost any time. There have, in prehistoric times, been eruptions in Nicaragua beside which that of Mount Vesuvius and others known to the human race would pale into insignificance. Disturbances of equal intensity may occur again."

CHAPTER XIII.

CONTINUED PANIC AT MARTINIQUE. — MONT PELEE AGAIN IN ERUPTION.—THRILLING ESCAPE OF A PARTY OF AMERICAN SAILORS.—HUNDREDS OF BODIES AFLOAT IN THE SEA.

WRITING from Fort-de-France May 20th, a visitor said: "Destruction is again threatened by Mont Pelée, the volcano having resumed an activity even greater than that exhibited when St. Pierre was wiped out of existence. For twenty-four hours the volcano has been in constant eruption, and explosions have been frequent. All in Fort-de-France are filled with panic. Last night was one of terror and wild alarm here. The earth seemed to have lost its foundations. Up through the crater of Mont Pelée poured a storm of death.

"The culmination came at an early hour this morning, when there occurred an explosion so terrific that walls in this city were shaken down and the inhabitants fled to the open country. It is said that the force of the explosion was much greater than that which accompanied the eruption which poured destruction upon St. Pierre. At this time nothing definite is known of conditions farther to the north. Smoke fills the air, darkening the sky. Ashes and stones are falling steadily.

"When the heavens are filled with lightning, as frequently happens, it can be seen that Mont Pelée has not ceased to throw out a great column of lava and stones. There has been a perfect calm in the air, yet the waters of the Caribbean are lashed to a fury, indicating that the same forces that caused the volcano to labor are working tremendous changes at the bottom of the sea. Words are inadequate to describe the actual conditions. Disaster is expected at any moment, and in the harbor every ship has steam up and ready to slip cable and speed away.

"A severe inundation at Basse Pointe, on the northeast coast of this island, at 2 o'clock this morning, swept away twenty houses, and fifty other buildings were damaged by the flowing

mud, which has swept over the Vallee de la Riviere. There was no further loss of life, Basse Pointe having been abandoned several days ago.

AN HEROIC SEARCHING PARTY.

"Beset by imminent and terrible danger, a party of officers and men from the Cincinnati and the Potomac went ashore at St. Pierre yesterday, and brought away the body of Thomas T. Prentis, American Consul. Advised to forsake their burden and save themselves, the men who were carrying the body refused to do so. On they stumbled through an atmosphere each second growing darker and more stifling. Their ears were deafened by the crashes that came from Mont Pelée. In the roadstead the British cruiser Indefatigable was running to sea, sounding her siren, which most of the time was silenced by the greater noise of the mountain.

"With steam up, the Potomac stood ready to run as soon as the rescue party could get out from shore and on board. To the general din it added its note of alarm. Finally the brave men were forced to rest their burden at the water's edge, while they made all speed to the Potomac. They were barely in time. As the steamship got well under way another flood of fire poured down from Pelée and a broad stream of lava ran into the sea, while out of the sky rained a storm of rocks and ashes.

"In spite of the threatening aspect of the volcano, it was determined later yesterday to make another attempt to recover the bodies of Mr. Prentis and Mr. Japp, the British Consul. By permission I accompanied the searching party, which was divided into two squads.

"One, led by Ensign Miller, went to the site of the American Consulate, and soon had the body of Mr. Prentis encased in a metallic and hermetically sealed coffin. Six stalwart fellows shouldered the body and started with it for the landing. In the meantime another party, led by Lieutenant McCormack, of the Potomac, had proceeded to the British Consulate, about a half mile to the northward of the American Consulate. Fortunately, this was within view of the crater of Mont Pelée.

"Lieutenant McCormack saw a column of smoke and fire belch from the volcano, down the side of which a stream of molten lava flowed. Directing his men to make all haste back to the Potomac, the lieutenant turned aside to give warning to the party which was carrying away the body of the American Consul.

"'For God's sake, boys, get to the boat quickly if you would save your lives!' he gasped. 'The volcano has exploded and destruction is upon us.'

"At that instant there was a crash in the sky, back of which it seemed as though scores of thunderbolts had been forged into one. As it died away, the loud siren of the Indefatigable, which was in the roadstead, screamed a warning. The British cruiser almost immediately put out to sea at top speed. Without cessation the whistle of the Potomac was blowing. There was another rumble, and the sky was filled with lightning. Then as I looked backward Mont Pelée cast upward a vast column, a mile or more high. By a fortunate turn of the wind the lives of all in the party were saved. The ashes, gas, smoke and stones, instead of pouring immediately upon us, were carried out over the sea.

"Working among the ruins were a few Frenchmen who had remained ashore after their fellows had fled in fright. These men became panic stricken. They fell upon their kness and prayed to be saved from the destruction which they feared was about to fall upon them. They were in hysteria. All the Frenchmen were in tears. Under the circumstances the presence of mind and bravery of the American sailors was worthy of the greatest praise. They refused to put down their burden.

"WILL SAVE THE BODY OR DIE."

"'If we die' one of them said, 'we will die with this body on our shoulders.'

"His followers had spirit enough to greet this sentiment with a cheer. It was heartening, and it served to shame the Frenchmen into a show of bravery. As rapidly as possible the sailors made their way through the debris to the shore. Once one of them stumbled. His fellows waited until he could recover

himself, when all went on together, still bearing the encoffined body of the Consul. Half a mile was covered in this manner. Each minute the sky darkened. The heat was beyond comprehension. In the air was volcanic dust that made respiration hard labor.

"Finally the distance was covered, and at the end it was discovered that, after all, the body would have to be temporarily abandoned. Heavy seas were sweeping shoreward. It was with great difficulty that the party was taken on board by the Potomac, but it was accomplished safely and just in time.

"Straight out to sea for five miles ran the Potomac, while all eyes watched the eruption, the grandest and most awe-inspiring sight ever witnessed by man. There was an inner column of fire that reached perpendicularly into the air. About it was a funnel-shaped mass of ashes and gas, that could be penetrated by the eye only when the flames burned brightest. Several new craters seemed to have been formed, and from them lava was flowing down to the ocean. As the molten mass joined the water great clouds of steam were raised, and the sinister hissing could be heard amid the roar of the eruption.

THE POTOMAC AGAIN PUTS BACK.

"When the Potomac had been put beyond the apparent danger zone an observation was taken. Then the ship was turned up the coast, and was run close in under the column of death. As close as the ship could be sent without courting destruction, the Potomac went to the stream of lava. All about us the sea was boiling, and the steam that came up over the sides was so dense as to make it all but impossible to see through it.

"Again a turn was made seaward, and as it was seen that the wind had shifted the danger from St. Pierre, we ran back to the landing. A party of sailors went ashore and brought off the body. We returned then to Fort-de-France, where all was panic. Terrible as was the eruption that came last night, it was mild in comparison with that which occurred early this morning. Owing to the hasty retreat that was made from the British Consulate the

body of Mr. Japp, which had been encoffined, was not recovered. It is now deemed too dangerous a task to return for the body, which lies about a mile back from the shore.

"Stifling heat preceded the last outburst of Mont Pelée. Not a breath of air stirred for two days. Rain fell, and the thunder that accompanied it found a deep response from the depths of the volcano. Finally there descended upon the island an almost overpowering sulphuric vapor.

"Many of the refugees and a large proportion of the inhabitants of Fort-de-France slept last night at the water's edge, ready to swim out to the ships, should that be necessary, to escape from the terrors of the volcano. Many believe that the worst is yet to come. Previous eruptions are referred to as proof that the first explosions are always followed by others of greater strength."

STORY BY A SHIP'S OFFICER.

Bringing two survivors of the steamship Roraima, which went through the rain of fire in St. Pierre harbor on the terrible morning of May 8 and was swept by the tidal wave, the Quebec line vessel Korona, a sister ship, reached New York May 20th. The men who passed through that awful experience are First Officer Ellery Scott and Charles T. Thompson, colored, who was assistant purser of the fated vessel.

Mr. Scott is a stalwart man of sixty. On the voyage he told to Captain John W. Carey, of the Korona, and passengers, his story of the horror. Both he and Thompson were still much shaken by their experience, and could only tell by snatches what really happened. This is his narrative:

"The Roraima arrived at St. Pierre at half-past six o'clock in the morning, and anchored, as usual, about six hundred yards from the city. There were about sixty-eight persons on our ship, including the crew, five passengers and some agents, peddlers and natives from the city who had come aboard. Captain Muggah was in the cabin arranging his papers, and I was below superintending the removal of merchandise consigned to the port. Three hundred yards away lay the steamship Roddam.

"Suddenly about eight o'clock the sky grew dark overhead. The sun seemed to have gone out and the shore became as indistinct as at twilight. Captain Muggah came on deck at that moment and, with a look of fright on his face, sprang for the bridge. He had barely reached his post when sea and sky were rent by a terrific explosion from Mont Pelée, like a half-dozen simultaneous claps of thunder. A rain of fire fell on the ship, and with it came the choking fumes of sulphur.

"'Heave away the anchor!' shouted Captain Muggah. I sprang upon the forecastlehead, and, with the aid of two sailors, began to take in the cable. The falling fire bit and stung us, and our nostrils were filled with the phosphorus that filled the air. We had reeled in fifteen fathoms of the chain when Captain Muggah, who had been joined by Third Officer Thompson, shouted again wildly :—

"'It's coming! It's coming! Open the windlass and let it run! Let it run!'

"We opened the windlass and half the chain had run out, when all at once there came a great river of burning lava rushing down the mountain side and into the bay, shoving the water out of the harbor. I started to leave the forecastle head, when a great wall of water, topped with fire and flame, rushed down upon the ship. Inky darkness had fallen on the bay behind us, but shoreward the blazing gases and lava illumined the scene.

STRUCK THE SHIP BROADSIDE.

"The wave struck the ship broadside on. She shivered, careened and I thought she would go down in the trough of the sea. Nearly everything above decks was swept away, funnel, masts, rails. I grabbed the iron cover of a ventilator and ran toward the steerage with the ventilator over my head to shield it from the falling cinders. I was caught in a rush of sailors and natives aboard toward the same shelter, knocked down and trampled upon. It was at this time that I received burns on my neck.

"The lava was pouring in on the vessel's deck, and members

of the crew and passengers were dying all over the deck, caught in the fiery stream. I should have been burned to death with the rest had not two steerage passengers, colored men from St. Kitt's, seized me and dragged me into the steerage. There we stayed, and, by wrapping our heads in wet blankets, escaped serious injury.

"Captain Muggah tried to jump overboard when he saw the wave coming, but was restrained by Third Officer Thompson. Both were swept into the sea together. When the ship righted, the captain was along side in the water. Daniel Taylor, the ship's carpenter, jumped overboard, and, drawing himself upon a hatch cover, dragged Captain Muggah upon it. A patch of fire fell squarely upon the captain's head, and when it rolled away it was apparent he was dead. Taylor jumped off the float to reach the ship, but was burned to death in the water. Captain Muggah's body floated away on the hatch cover, which was burning at four corners like a funeral pyre.

MONT PELEE AGAIN IN ACTION.

"I remained below until the rain of fire ceased, and then went on deck. Mont Pelée was still in action, but dust and sand, not fire, was falling. It was still as dark as night in the harbor. It could not have been more than two or three minutes between the time the sky first darkened to the time the rain of fire ceased, and I returned to the deck. Of the sixty-eight persons on board only thirty remained alive, and the vessel was afire in a dozen places.

"I saw the Roddam coming down upon us, apparently unmanageable. There was a man at the Roddam's wheel and I ran below, seized some blue fire and burned it to warn the Roddam off. She nearly collided, backed away and turned to sea. Then I turned my attention to his own crew. Only five or six were fit for duty. We together carried our suffering comrades below and made them as comfortable as possible. Then we began to fight the fire on the ship. Our struggle continued until noon, then most of us began to build a raft out of materials gathered below deck.

"We were three hours building and provisioning the raft. Life preservers were strapped about the injured, rough oars were constructed, and even a spar and some sails were got ready, for I intended, if possible, to make my way toward the open sea. Suddenly, through the gloom, at three o'clock, we saw the French cruiser Suchet loom up twenty ship lengths away. Every man on deck shouted together for help, and everybody wept tears of joy when a boat came alongside and fifteen marines began the work of rescue.

"The Suchet took off thirty persons altogether from the Roraima, but some died before the ship reached Fort-de-France. Most of them suffered terrible agony, being burned internally as well as externally. The red hot lava, during the first few minutes it fell, entered their noses and mouths, and even penetrated their ears.

HUNDREDS OF BODIES AFLOAT.

"I saw hundreds of dead bodies in the bay. They floated about in the harbor near the entrance, whence they had been borne by the tide, and the entire place was a vast charnel house.

"First Officer Scott's son was among those lost by being swept overboard. Thompson, the assistant purser, owes his life to the fact that he was asleep in his bunk when the eruption occurred and the tidal wave struck the ship. When the rain of fire descended upon the Roraima Thompson drew the bed clothing about his face. There was an open porthole in his cabin, and the burning lava, rushing in, burned the back of his head, which was turned toward the aperture. He escaped other injury."

Captain Carey of the Korona, said he never saw anything as ghastly as the harbor of St. Pierre, when he entered it on the morning of May 9. He had heard explosions the day before, and ashes and cinders fell on the vessel. He went on:

"We started for St. Pierre and arrived at 9 o'clock in the morning of Friday. Mont Pelée was still sending up smoke and dust that spread out like an umbrella and overshadowed the landscape. The sea seemed to be covered with a scum which resembled mud. As we approached what had been St. Pierre its

outlines were invisible in the fire and smoke. At a hundred points tongues of fire were shooting up, indicating where buildings were burning.

"We ran toward the anchorage where the Roraima usually lies, and there lay a blackened hull which I knew must be she. There were three or four other smoking black hulls in the harbor, two of fairly large vessels. We steamed through the bay, looking for signs of life, but saw none. No trees were standing within a distance of miles and the scene was one of indescribable desolation."

The Korona remained in St. Pierre Bay an hour, and then ran to Fort-de-France where were found the survivors of the Roraima. On the way back the Korona ran into St. Pierre harbor, in the hope of finding the body of Captain Muggah, but did not succeed. When they passed the burning city at 4 o'clock on Friday afternoon, the air was then full of sulphurous fumes and thick smoke hung over the island.

SURVIVORS TELL OF THEIR ESCAPE.

There were twelve white passengers on the Korona. Herman Rosenberg, who lives in Philadelphia, visited the hospital of Fort-de-France and heard from survivors the story of their escape. A native told him that he ran for ten miles when the fire struck St. Pierre, until he dropped from exhaustion. People running ahead of him were struck down by the fire, and several times he fell over their bodies. Each one struck looked as if he had been hit by lightning. His last fall was near a brook, but when he scooped up the water to drink it he found it boiling hot. He lay by the stream until rescued by some natives more fortunate than himself.

Mrs. Kate Krilly, the stewardess of the Korona, has a rocking-chair of which she is proud. It was picked up in St. Pierre harbor by the officers of the cruiser Suchet, who gave it to her.

Charles Thompson, assistant purser of the steamship Roraima, referred to above, told the following story of the struggle on that vessel in the harbor of St. Pierre, during the eruption of Mont Pelée.

We left Antigua at midnight, May 7, and arrived off Martinique at daylight May 8. Our people had seen the fire from Mont Pelée for many miles at sea during the night, and now as we came up into the roadstead in the daylight the pillars and waves of flame gushing out of the top of the volcano appeared to be rising a hundred feet in the sky. Several of the passengers came on deck early to watch the eruption of the volcano.

The Roraima steamed up to her usual station off the northerly part of the city of St. Pierre less than a quarter of a mile off shore. The water of the harbor was quite smooth, and although enormous quantities of flame and smoke were boiling up out of the crater of the volcano the sky was not darkened and the view was excellent.

The crater seemed to be about three and a half miles from the shore, a little by the head of us and over the port bow. The West Indian and Panama Telegraph Company's steamer Grappler was lying moored to a huge buoy. Thus she proved a big screen between us and the fury that rolled down upon us afterward.

SAVED BY THE GRAPPLER.

Not one of us on the Roraima would have escaped with his life if the Grappler had not been in a position to protect us. About a mile and a half astern of us the steamship Roddam lay at anchor at the quarantine station. Altogether there were many ships in the harbor. I went on deck early and found many of the passengers and all of the crew who were not on duty below, lined up on the port side, watching the show.

As it was Ascension Day no one in St. Pierre would do any work. The company's agent and the stevedore and his assistant came alongside the Roraima a little before 7.30 o'clock and notified Captain Muggah of the holiday. While on deck they remarked to Purser Brown and First Officer Scott that the volcano was at its worst. They had never seen it so bad before. Evidently that was the opinion of everybody in St. Pierre, for the piers, the streets, and in many cases the housetops, were covered with spectators, enjoying the majestic spectacle.

After our visitors left, Second Mate Moreley said to Purser Brown and me: "If the captian gives us permission, will you go ashore with me and get as close as we can to the volcano?"

I replied: "No. I value my life more than that. I have read all about volcanic eruptions, and I wouldn't be foolish enough to go near one."

This was about five minutes before the underground fires tore Mont Pelée to pieces. At this time all of the passengers, except Mrs. McAllister, who, on account of her delicate health, remained in her second cabin stateroom on the port side of the main deck amidships, were lined up on the port rail enjoying the sight. Most of the crew were lined up on that side, too. I don't suppose that there were twenty persons below out of our ship's company of sixty-eight. Captain Muggah had not yet left his bed in his room under the bridge.

MONT PELEE BURST OPEN.

While Moreley, Brown and I were standing in the alleyway on the starboard side of the ship, not far from my stateroom, which was a little forward of midships, we heard a terrific explosion on Mont Pelée. The sound seemed to crush everything flat. We saw that Mont Pelée had burst open about one-third of the way from the top and fronting us.

There gushed out of this great vent, which was fully a quarter of a mile wide, an awful mass of fire, thousands of times greater in size, but like the gush of fire that darts out a cannon that is fired at night. At the same time the sea began to boil in frothy waves, as if stirred up by some power, the movement far below the surface. In less than a minute the fire leaped from Mont Pelée down upon the city of St. Pierre, struck the water with a frightfully loud hissing sound, and came rolling over and over upon itself as it advanced upon us.

I never saw anything like the rolling of this wave. It advanced like a gigantic beach comber of flame, with its top part always rolling down and under the mass, and with the after part of it constantly rising up to a height of more than a hundred feet, and

as the great mass of flame leaped in our direction. Vast clouds of steam arose from the contact of fire and water. The fire seemed to blot out the city of St. Pierre from our sight. There rose up an outcry of myriads of voices. Now, as the fire wave advanced close to us, the steam arose in great clouds and cut off from view what was left of the ruined city.

"Run for your life, Mr. Brown!" I said to the purser, as I saw the flame dashing down the mountainside.

"Oh, no; it will stop when it gets to the water," Mr. Brown replied. That was the last I ever saw or heard of the purser. I turned and ran into my room on the starboard side of the ship.

TOSSED IN A BOILING SEA.

At that moment the Roraima was tossed about in the boiling sea and a great whirlpool pulled her far over on the port side. Then the terrible hurricane of fire struck her and heeled her far over on the starboard side, so that she lay almost on her beam ends. At the moment this fire wave swept over us I heard a noise, frightfully loud and threatening. That was the sound of our two masts and the smokestack and the port side of the bridge being swept away like chaff.

Even then we had not received the full force of the fire blast, for the cable steamship Grappler served as a screen for us. I was told that later the Grappler was flung down on her side, blazed up in flame in every part of her hull and plunged down beneath the water all in an instant. I should have said that when Captain Muggah heard the explosion he leaped out of bed, dressed only in his night clothes, and ran up on the bridge. He was a brave man.

"Mr. Scott," he called to the first officer, "get ready to heave the anchor."

Then the captain called down through the tube to Chief Engineer McTear:

"For God's sake, let us get out of this as soon as we can."

We had full steam up in one boiler and the other fire banked. The chief and the third engineer made a rush for the engine room to help get the ship going.

First Officer Scott yelled to the carpenter, a Swede named Benson: "Carpenter, get the windlass ready to heave." The carpenter ran towards the windlass, and just then the fire blast struck us and swept him away, so that he never reached the windlass.

Mr. Scott was running for the companion ladder, so as to get up on the forepeak, where he could give further orders, when a big, black laborer from St. Kitts, whom we knew only as Squashi, seized him around the waist and dragged him into the steerage. That act saved Mr. Scott's life, and neither he nor Squashi was even singed by the fire.

WATER WAS SCALDING HOT.

When I ran into my stateroom on the starboard side of the ship my idea was to plunge under the bedclothes in my berth and so protect myself from the wave of fire and gas from the volcano, but before I got half way covered the fire hurricane hurled the ship over almost on her beam ends on the starboard side. The porthole of the stateroom was wide open, and the green water came dashing in in a great force. It was almost scalding hot.

The inrush of the water swept me off my berth, and I staggered out into the middle of my room. The water was so hot that I felt as if I was burning up, and I madly tore off my coat and waistcoat. As the ship rolled still deeper to the starboard I thought she was going to turn turtle and sink. As the Roraima lay wallowing in the sea and trying to pick herself up I held fast to the electric light fixture. I jumped outside then, into the gangway. Captain Muggah was on the bridge giving orders and trying to save his ship when the blast of flame overwhelmed him.

Bareheaded and dressed only in his night clothes, his hair was singed off and he was burned from head to foot. Then whether he was crazed and delirious by the pain, or whether he became so weak that he could not support himself, I do not know, but our captain immediately fell overboard.

Cooper Daniels jumped after him. He caught Captain Muggah by the shirt collar and tried to bring him back. Just then

the booty hatch torn from one of the American schooners came floating by and Daniels got onto it and pulled the captain up on it, too. For many minutes Captain Muggah lay unconscious and Daniels thought he was dead. Then he was surprised to hear him say suddenly:

"Get me back; get me back to Mr. Scott. For God's sake get me back to the Roraima. I want to die on board my ship. I am willing to die, but I must go aboard my ship."

Then the captain lay back as if dead, and he never spoke or moved again. When he was convinced that the captain was dead, Daniels plunged overboard and swam to the Roraima. As he came over the side he saw the stewardess, Mrs. Reid, all burned and bleeding, and with her clothes hanging in burned and bloody shreds.

"My God, what's the matter?" cried Daniels. And he ran forward to where he had left his companions in the steerage.

HE SAT THERE DEAD.

It was at this time that I made my way forward from my stateroom. I saw the pantryman, a young fellow, named Hirgston, sitting crouched by the No. 2 hatch. I found that he was dead. His hair was all burned off, his skin was scorched black, his clothes and skin hung together in ragged patches. The blast of flame had passed long ago, but at the moment of the explosion there were hurled into the air many tons of hot lava and pumice stone. This now came down upon us in a rain of fire. Everywhere that they fell they started a fire.

Ashes were falling with this hail of fire, and breathing was almost impossible. It was impossible to see any distance. The roaring of the volcano, the shrieks and cries of the dying, the rain of fire and ashes, and the poisonous gas everywhere made it seem to me as if the end of the world had come and we were all in hell. The ship was on fire in both of the holds forward and her saloon aft was blazing.

The rain of burning pumice stone lasted only three or four minutes. Mr. Scott, Squashi, Daniels and I stood looking at each

other. Everywhere that we went lay dead men and women and dying people, who were so scorched and torn and disfigured by the fire that no one could identify them. They were all begging for water. I am sure they must have inhaled the flames.

When we went aft we saw Nurse King and little Margaret Stokes coming to us from the saloon. The nurse was burned, but the child was entirely safe, unless she had inhaled flame or gas. They begged for water. I ran forward to the messroom to draw some, but I found the messroom tank tossed up on deck, wrenched apart by the fury of the fire hurricane, and not only empty, but scorched dry. I got a pitcher of water from the washstand in a stateroom.

"Let's put out the fire in the forehold," Mr. Scott said, and we four got fire buckets. We did pretty well with the forehold, but forward of that we found the firemen's forecastle smoking and went in there. The mattresses were on fire in the firemen's bunks. As we pulled out the mattresses to throw water on them one dead body after another rolled out on the floor. These were the firemen, oilers, etc., who were off duty at the time the volcano exploded. The door of the forecastle was shut and the portholes open. They were not burned, and I believe that they must have died from inhaling the flame and the poisonous gases. We put out the fire in this forecastle. The rain of fire had ceased, and we were groping our way in the darkness that was almost like that of midnight.

THE RODDAM CAME ASTERN.

A big steamship, which we knew must be the Roddam, came up astern of us as if she was going to pass. Mr. Scott ran up on the bridge and burned three Coston lights. He got no reply from the Roddam. I know now that the only reason why she did not answer us was that everybody aboard her was killed or disabled except three or four men. Cooper Daniels suggested that we throw one of the skids overboard and use that as a raft. We launched the skid.

Then we saw a ship's light coming toward us, and soon we

made out the French cruiser Suchet. Some one on the Suchet hailed us from the bridge.

"How many of you are there on board?" asked the Frenchman.

"I don't know," answered Mr. Scott, "but some of us are dead."

"Get all the living together, and we will take you aboard our ship," the Frenchman called to us. There came to us out of the darkness a big cutter, manned by French bluejackets.

Now, for the first time, we began to take an accurate account of how many living there were aboard our ship. Including those who showed the very faintest signs of life, there were only twenty-two out of our ship's company of sixty-eight. Twelve of our injured were taken aboard the Suchet at 9.30 A. M. Most of them had the hair burned off their heads. The faces of all of them were swollen and cut, and they were disfigured.

TRANSFERRED TO THE WARSHIP.

It was necessary to place each sufferer in a sheet, which was carried by four men of the Suchet. With two men lowering the sheet by the corners and two standing below, at the edge of the slanting deck of the Roraima, to receive them at the rail, our poor fellows were lowered with great care, and then handed down aboard the man-of-war's cutter.

Last of all we took Nurse King and the little Stokes child, and Mrs. McAllister. The sailors from the Suchet carried Mrs. McAllister very tenderly to the side of the ship and lowered her into their boat. The captain of the Suchet left a rescue crew on board the Roraima to gather up the rest of the sufferers, and headed his ship for the city of St. Pierre.

He picked up about seventy persons at the northerly end of the city. Some of them were on rafts, some on logs and some were swimming. At 2.30 o'clock we started for Fort-de-France. At this time a little of the smoke had lifted, and we had occasional glimpses of the ruins of the city of St. Pierre.

The city and all the country around it were blackened with

fire, both the shattered walls of the houses and the remaining charred bits of trees and vegetation looming up blank over the great clouds of dark, grayish-brown ashes that had settled over everything.

Flames were still arising from hundreds of houses, showing that all the inflammable material in them had not yet been consumed. The shipping at the piers had vanished and had left no trace. From the crater of Mont Pelée down to the sea there ran a broad river of molten lava, roaring flame at its upper end and the hissing sea at its terminus. The last we saw of the Roraima she was lying almost on her beam ends, with fire blazing out of the steerage, both the holds and the saloon. I have heard since that she burned to the water's edge and sank.

ONLY FOUR HULLS LEFT.

Out of the fleet that was at anchor in the harbor of St. Pierre moored to the wharves only four blazing hulls were left. Four of our men died on the short run of ten miles to Fort-de-France, so there were only eighteen to take to the hospital there. The doctor in charge at the hospital told me that Mrs. McAllister cannot live. Out of the eighteen carried to the hospital the doctor says only four will survive—Nurse King, the little Stokes girl, Second Mate Moreley and Carpenter Benson.

We left Fort-de-France at 11.30 o'clock Friday, when we sighted the Korona. We saw her at the off-shore station, four miles away, and we had a native boatman to take us out. We were all in rags, and I don't think any of us noticed that until we found ourselves on the deck of the Korona. My costume consisted of a battered old hat that I picked up in Fort-de-France, my suit of underclothes and an old pair of trousers tied around the waist and at the ankles with marline, no stockings, a man's slipper on one foot and a woman's slipper on the other.

When Mr. Scott and I stepped over the side to the deck of the Korona we were so shaking and trembling that we couldn't walk or talk. It makes me shake even now to think of the hell that we went through at St. Pierre. I am not much burned, as you

can see, but the afternoon that we left the Roraima Mr. Scott had to crumble the ashes off my head, where they had caked in my hair and formed a crust just as melted sugar would. Mr. Scott and myself have suffered more from the terrible shock than anything else, and I don't think we will ever get over it completely.

Mr. Scott lost his son, a very fine boy eighteen years old, who was taking his last trip with him on the Roraima before going to college in Canada. I think in the end that it will be shown that altogether the eruption of Mont Pelée killed 47,000 men and women in and about St. Pierre.

An interesting passenger on the Korona was Mrs. H. Merrill, of New York, who saw the still smoking ruins of St. Pierre from the deck of the ship the day after the disaster. Following is her personal narrative:

"I took passage on the Korona, which was to have touched at St. Pierre, May 8th, the day of the explosion of Mont Pelée. We escaped with our lives by a lucky chance. The ship remained at Barbados instead of proceeding according to schedule to St. Pierre. The morning of May 8th we heard sounds as if of terrific cannonading.

SKY BECAME BLACK.

"In the afternoon I was out with a coaching party. The sky was suddenly overcast and it grew darker and darker, until by 5 o'clock the blackness was intense.

"During the night a fine volcanic dust was sifted from the clouds and fell in blinding and choking quantities. The sky had cleared the next day when we sailed, and although Captain Carey, of the Korona, knew there had been a volcanic eruption, he did not know it was Mont Pelée. We headed for St. Pierre, which lay on our regular route, to pick up the mails and take on passengers.

"Fifty miles away the dust from Mont Pelée continued to descend, but in lighther quantities. Soon we caught sight of the great cloud of steam and smoke hanging above the crater of the volcano. We arrived in front of St. Pierre the morning of May

9th, the day after the eruption. A thick pall of smoke hung over the place and the ruins were still burning. We entered the harbor for a closer view, and approached, I believe, within a half mile of the Roraima and the other shipping that had been destroyed. The Roraima was lying in shallow water and was still smouldering.

"Not a living thing was seen about the harbor, but bodies were floating everywhere in the water. When the first officer of the Korona saw that a ship of his own line had been destroyed and that most of his brother officers had perished he burst into tears.

NO LIVING THING IN VIEW.

"Lava was pouring from the side of the mountain, and I saw a valley in which hundreds of people had lived completely filled with a river of the burning matter. The aspect of the scene was whitish, and the mountain and the town were covered with a cloak of ashes that looked like snow in the sunshine. A great cloud of white vapor was above the active mouth of the volcano. The desolation was complete, and there was not a sign of a living thing as far as the vision could reach.

Captain Carey soon discovered that he could do nothing, and we made our way to Fort-de-France, where we arrived early in the afternoon. Between St. Pierre and Fort-de-France we picked up six negroes in a dugout. They had been inland and had escaped to the shore and taken to the canoe. When we got within hailing distance of them we heard their cry for help. They had been burned and had endured much suffering. We landed them at Fort-de-France, where we took aboard First Officer Scott and Assistant Purser Thompson, of the Roraima, and brought them to New York."

Herman Rosenberg, a resident of Philadelphia, who was near St. Pierre during the volcanic eruption and was an eyewitness to the death and destruction left by it, described his experience. He arrived in New York on the steamship Korona, of the Quebec line.

About forty refugees, mostly negroes, were brought on the

ship, together with two of four sailors rescued by the Korona from her sister ship, the Roraima, which was destroyed in St. Pierre harbor. Of the sixty-eight persons who were on the Roraima these four men only were saved. Said Mr. Rosenberg:

"I was at Barbados, about 100 miles south of Martinique, May 8. Our vessel, the Korona, was to have sailed the day before, but was delayed in shipping a cargo. It was about 4.30 o'clock in the afternoon when it began suddenly to grow dark. About five o'clock we heard what seemed to be a heavy crash of thunder, followed by mighty rumblings. Then all was still. The darkness continued. The next morning everything was covered with a heavy ash and sandy soot.

"We sailed for Martinique at 5.30 the afternoon of the next day, and reached St. Pierre at 9 o'clock the following morning. As far as the eye could see inland the utmost desolation prevailed. If there is any word that will describe the appearance of the landscape it is 'whitewash.' A vast field of slaking lime might have resembled the scene, with the thick, steamy fumes rising continually from it. Not a living human being was to be seen—not a tree, nor a shrub, nor a blade of grass. Nothing was visible but that awful vaporous white, and overtopping all the devilish Pelée, still vomiting lava, which flowed thickly down its white sides into the sea.

MANY VESSELS DAMAGED.

"In the harbor every vessel was stripped of masts and deck housings. We could do nothing. Captain Carey had the Korona steam about for an hour or so, and then we left for Fort-de-France. As we were coming into the harbor we picked up a small boat in which were four men. Two of them spoke English. They were sailors from our sister ship the Roraima, which had touched at St. Pierre, bound to Barbados.

"It is true that it is foolish to send more money or supplies to Martinique. It would be a waste and could only serve to foster pauperism. St. Pierre is dead. All its inhabitants are dead, and it will never arise from its ashes. Nobody would live there now. Outside of St. Pierre the people are not in want. When all the

bodies are taken care of there will be little more to do. The volcano left little to be done."

Despite the fact that the British steamship John H. Barry was 480 miles distant from the island of Martinique on the day of the eruption of Mont Pelée, the decks of the vessel were covered with a reddish dust, which none on board could account for. The Barry, in command of Captain Griffiths, arrived from Maceio, Brazil.

Captain Griffiths said that the first appearance of the dust was noticed on the morning of May 9. The position of the vessel at that time was latitude 15.49, longitude 50.36, or about 480 miles to the eastward of the island. For two days the dust settled on the decks and in the cabins, until they were covered with a coating at least an inch thick.

LETTER FROM ST. THOMAS.

"So rapidly have the horrors of the last fortnight piled upon one another that it now seems ages since the first news was received here. It was Saturday, May 3, just ten days ago, that the first cablegram received from Martinique announced the activity of Mont Pelée, and gave warning of the disasters that were to follow.

"St. Thomas learned that Pelée had been threatening for ten days, and that on May 2 it had begun serious operations. Volumes of smoke issued from the mountain, accompanied by rumbling noises. At midnight flames had been seen. Naturally, all in the neighborhood of the volcano were in a state of consternation. Some took the warning and left St. Pierre, but the great proportion of the dwellers in the city remained to meet their fate. The next day (Sunday) ashes began to fall, and thereafter business in the city was practically suspended.

"It is worthy of note that the flames were first seen to issue from the old crater, which had for a century been filled by a lake of great depth. The question will be asked, 'What became of the water that was in the lake?'

"Scientists here believe that it was when this water reached the

slumbering fires beneath that the explosion occurred. Cables came through on Monday, May 5, telling how the Sabbath had been spent in St. Pierre—the last Sabbath that most of those in the city were to know. A sea breeze had kept the ashes from falling upon the city, and all were more hopeful. Yet the day was one of prayer, with Thanksgiving added.

THE FIRST SERIOUS NEWS.

"Then came the first really serious news. It was told by the cables on Tuesday that there had been an eruption, which had destroyed a large sugar factory, the Usine Guerin, two miles from St. Pierre. Lava had poured upon the factory, and it was reported here that one hundred and fifty persons were missing. It was not believed in St. Thomas that this could be true. It seemed impossible that so great a catastrophe could occur. But a gloom came upon the people of this island, who had many friends and relatives in St. Pierre.

"That same day the news was received that La Soufriere had become active, and that great trouble had resulted in the island of St. Vincent. All of this served only to impress every one with the possibility of great disaster, but no one was prepared for the sacrifice that was soon to be reported.

"With orders to repair the cable between Dominica and Martinique, the cable ship Grappler left St. Thomas Monday afternoon. Even then it was feared that danger awaited the ship, and the captain was instructed to use his own discretion, and to take no unnecessary risks. All communication with Martinique ceased on Wednesday. It was announced that the cables were broken, cutting us off from the islands of Barbados, Grenada, St. Vincent and Trinidad, and from Demerara. Detonations were heard from the south. It was like the heavy guns of a ship-of-war far out at sea.

"It is now believed that these first detonations were submarine. That is indicated by the fact that they were heard on other islands, coming from different directions. They were heard over an area of more than five hundred miles

"Panic was beginning to make itself felt here. That night (Wednesday) the Valkyrien prudently steamed out of this harbor for sea room. It was feared that there would be trouble here and that the ship would not have room to manœuvre for her own safety. No news was received here on Thursday until evening, when the report was circulated that some terrible calamity had befallen St. Pierre. From St. Lucia came a cablegram announcing that the Roddam, which had left St. Lucia for St. Pierre on Wednesday, had returned a wreck, with many dead aboard and with others so terribly injured that they could not recover.

"It had been told by the Captain of the Roddam that St. Pierre was destroyed and that all of the shipping in the roadstead was gone. That was a terrible blow to us in St. Thomas. We knew that the Roraima was there, and it was feared that the Grappler had gone to St. Pierre from here. That fear was soon known to be too well founded. The next day will be long rembered as Black Friday here—a day of mourning and heartrending grief to many among us—a day to make even the most thoughtless shudder and stand aghast. The mind first failed to take in the enormity of the calamity.

NO NEARER THAN FIVE MILES.

"The R. M. S. Esk had failed to communicate with St. Pierre on Thursday night. The conditions were then, sixteen hours after the catastrophe, so threatening that the captain dared not take his ship nearer than five miles, but, loath to leave without at least trying to do something, a boat was sent in through the impenetrable darkness. How near the boat got we know not, but near enough, at any rate, to send us word that St. Pierre was in flames not a soul was to be seen.

"A slight description was received from Captain Gumbs, of the Ocean Traveller. He had been driven from St. Vincent by the threatening conditions there, and had started for St. Pierre.

"He had not reached the roadstead when the explosion of Mont Pelée occurred. He was near enough to see the awful fate of the Grappler, the Roraima and of the other ships in the road-

stead. It is his belief that the volcano broke through and formed a new crater below the old one, and that the water in the lake finally cut through.

"It can well be understood what an explosion would occur under such circumstances. It would account for the sheet of hot air that was followed by fire and then by ashes. It would explain how the inhabitants were suffocated before they could realize the peril that was upon them. What seemed like an eruption, Captain Gumbs believes, was an explosion that scattered fire, boiling water, hot mud, rocks, ashes and lava for miles, in all directions. Meanwhile the terrible news continues, and we in St. Thomas fear that other and greater explosions are to come."

CHAPTER XIV.

TERRIBLE PANIC FOLLOWS FRESH OUTBREAK OF MONT PELEE.—FRANTIC EFFORTS TO ESCAPE TO THE SHIPS AT FORT-DE-FRANCE.—MANY RESCUED FROM UNDER THE SHADOW OF THE DEATH-DEALING MOUNTAIN.

ON May 21st the scenes of ruin and alarm on the ill-fated island of Martinique were vividly pictured as follows by an eye-witness :

"Another day of terror and panic has been spent by the people of Martinique. For six hours yesterday Fort-de-France was literally bombarded by Mont Pelée. Stones, many of them incandescent, rained upon the city from the clouds. Houses were destroyed and fires were started in many quarters. With the stones fell hot mud and ashes. The air was so filled with volcanic dust that it was barely possible to breathe. At times it seemed as if suffocation must be the fate of all who could not be taken on board the ships in the harbor.

"While the loss of life has not been great, the eruption yesterday was far worse than that of May 8, when the thirty thousand inhabitants of St. Pierre were destroyed. For many hours the explosions were so heavy that it seemed as if the island would be shaken from its foundation. Down upon the ruins of St. Pierre fell great boulders, all red hot, that battered what was left of the unfortunate city beyond all semblance of its former self. Ashes fell in torrents and it is reported that the site of the city now resembles a great gray plain.

"Thousands have left Fort-de-France. Some have gone into the mountains, to almost certain starvation, preferring that to the fate that would be theirs if the lava of Mont Pelée buried them in the ruins of the city. Others have gone to nearby islands, there to depend upon the charity of strangers.

"Every ship in the harbor is constantly crowded with those who would flee at the next appearance of great danger. Clustered

about the ships are small boats filled with natives, who beg to be taken up. Hundreds, finding it impossible to obtain boats to take them to the ships, have swum out, risking their lives in the water to avoid the danger which fills them with more terrible dread.

"One who took this mode of escape is Richard Kadish, of Westminster Park, Manchester, England. Mr. Kadish has been traveling through Venezuela with William R. Grace, Jr., of New York, and arrived here a few days ago. When the culminating explosion came yesterday morning, and fear struck to the heart of every person on the island, Mr. Kadish rushed to the shore and plunged into the water. He succeeded in removing his shoes and then kicked off his trousers. Being then little weighted with clothing he struck out for the British cruiser Indefatigable, which was nearly a mile off shore, with steam up and ready to put to sea. He reached the ship safely, though much exhausted. He remained until evening, when he returned to shore, the explosions having perceptibly lessened.

BRAVE WORK OF AMERICANS.

"In the excitement time is found to give praise to Lieutenant McCormack and the American officers and men under his command, who have never lost their presence of mind and are working bravely to save those unable to save themselves. The Potomac, which Lieutenant McCormack commands, was ordered to run down the coast to make observations of Mont Pelée in eruption. Just as on Monday the ship was taken down under the volcano, where it remained until driven away by the flow of lava, which reaches far out into the sea.

"Lieutenant McCormack brought back a report that new fissures have formed in the sides of Pelée and from them lava flows in broad streams. All along the shore near St. Pierre the water is boiling, and such curtains of steam rise that a view of the land is possible only when the wind blows with sufficient force to lift them for a few seconds.

"St. Pierre is described by Lieutenant McCormack as driven into the earth. About half the city has been buried deeply under ashes, which constantly fall. The heat from the volcano was so

great, and the Potomac went so close in shore that she returned with the paint on her sides blistered.

"On the way back from St. Pierre Lieutenant McCormack saw a great crowd of men and women on the shore, signalling wildly for help. All were taken on board and brought to Fort-de-France. Those thus rescued were almost starved. Supplies were given to them and they were turned over to the relief committee here.

"From all parts of the island not cut off by the flow of lava, refugees are coming into Fort-de-France. The mountain roads are filled with panic-stricken and starving natives. Arriving here their terrors do not decrease, and they are as anxious to press on to some safer place as they were to get here. All the roads are dotted with dead, and many are reported to be dying, having fallen from weakness on the way. Liberal wages are offered for rescuers to go out and assist those who have fallen by the way, but the laborers are too full of fear to be tempted by any offer.

CLOUDS THAT WERE FIERY RED.

"The panic was greatest yesterday when the sun rose, shining faintly through the haze of ashes. The skies were filled with rolling and whirling clouds that were fiery red. Many believed that flames were about to fall upon them from the heavens, and the terror that ensued was pitiful.

"The spectacle was so appalling that the populace could not appreciate the sublimity of it. Quickly the streets were filled. Soldiers and sailors mixed freely with the citizens, all frightened witless. All struggled to get a place of safety, they knew not where. All believed that where they were was the place of greatest danger.

"Some cursed in their frenzy, thinking it was prayers they were uttering. Others fell on their knees in the streets and besought protection from above. Few were able to refrain from tears. Then when the panic subsided a little there was a general scramble for the mountains or the water front.

"When the Potomac started for St. Pierre the French cruiser Suchet went outside and made a tour of the island in the opposite direction. She passed St. Pierre, but had no part in the work of rescue of the refugees who had been driven to the shore by the storm from the volcano.

"When the two steamships returned to Fort-de-France they found the panic here even greater than when they went away. There had been a recurrence of the detonations, and stones had again fallen upon the city. A steam launch from the Cincinnati picked up one hundred persons who were struggling in the water and took them to the Suchet. Scores of others were taken to the Cincinnati and to the Potomac. The small boats of the latter ship were out constantly, saving many who otherwise must have been drowned. This was a work of much danger, as the sea was as rough as if a hurricane was blowing.

SUFFERING FROM LACK OF WATER.

"Supplies are here in plenty for the present, but great suffering has been caused by the lack of water. All of the natural water supplies have been polluted by the lava, which has developed sulphuric acid. Water is being doled out from the ships and word has been sent to nearby islands for a greater supply.

"Extravagant prices are demanded for transportation. Those fortunate enough to own small boats that are sufficently seaworthy to make the run from here to the nearest islands are making themselves rich by taking away those who desire to escape the wrath of Mont Pelée. Hundreds have gone, and thousands are waiting only for an opportunity to get away.

"Two men of great daring penetrated the island yesterday far enough to get a glimpse of Mont Pelée from inland. They report that the entire northern half of the island is running with fire. The volcano is in constant convulsions. The men say that as the clouds of smoke and fire lift the mountain can be seen throwing out great quantities of lava and hot mud, which is so liquid that it flows like water and is filling the valleys with lakes, from which a sickening sulphurous vapor rises."

The last words of Thomas T. Prentis, the American Consul at St. Pierre, were: "There is no danger. Don't be afraid."

Mr. Prentis made this remark to Ferdinand Clerc, Mayor of La Trinite and one of the millionaire planters in the island, who was on St. Pierre half an hour before the eruption occurred. Mr. Clerc had been told by his father of the horrors which occurred on the occasion of the former eruption of Mont Pelée, and, when on May 7th, the mountain began to show signs of activity, Mr. Clerc made all arrangements for the removal of his family.

On the morning of May 8th, he was waked about 6 o'clock by loud detonations, and looking from his bedroom window he saw that the mountain was emitting a thin blue vapor, which by its simmering effect he realized to be the over-heated air above the crater.

CALLS ALL HIS FAMILY.

Without a moment's delay, scarce pausing to dress, Mr. Clerc ran out of the house and ordered the negroes to hitch up every horse and mule on the farm, and by 7 o'clock he and his family had left their home. Twenty-eight relatives and friends who had gathered the night before, however, refused to leave in such haste, stating that they did not expect there would be an eruption before they could get their breakfast.

As Mr. Clerc drove out of the city he passed the American consulate and at the door Mr. Prentis was standing. Mr. Clerc called out to him to flee with him, but Mr. Prentis waved his hand, laughed and tried to dissuade the planter from going, saying there was no danger.

Scarcely had the carts arrived at Morne Rogue, six miles from the city, when Mr. Clerc heard a loud roar and, looking back, saw a huge mass of slate-colored stones and ashes burst from Mont Pelée and fall on St. Pierre. This was immediately followed by a great wall of flame which seemed to rise and topple over upon the doomed town. So far as Mr. Clerc could see from Morne Rouge the whole eruption did not last above two minutes.

Mr. Clerc asserts that everyone in the city should have been

able to escape the day before, for every barometer in the town was wildly fluttering and it was the talk of the town the evening before the eruption what this disturbance of atmospheric conditions might portend. Mr. Clerc spent several hours on the evening of May 7, trying to induce the people to leave, but his advice was discredited.

CONSUL'S BODY BURIED TO VOLCANO'S SALUTE.

Never before was there a burial such as was given to the body of Thomas T. Prentis, the American Consul at St. Pierre. The body, recovered from the ruins at the risk of the lives of the men who were sent ashore from the Potomac, was taken to the cemetery back of Fort-de-France. There were brief services at the grave, led by Captain McClean of the Cincinnati. About the grave stood officers, marines and sailors from the Cincinnati and the Potomac. The gloom was made more intense by the knowledge held by each one present that his own life was in imminent danger.

Salute was fired by the volcano that had brought destruction upon the Consul. While the service was being read there was a succession of deep, sullen detonations that might have come from great guns belonging to a mighty fleet. As the grave was being filled a cloud of ashes came over the city and a darkness, as of night, followed.

"With three hundred refugees on board, the collier Helga arrived at St. Lucia on the 21st from Fort-de-France. Many of those on board had barely sufficient clothing to keep them covered. They said that they fled, believing that Fort-de-France was about to be destroyed as St. Pierre was. When they left, hot stones and mud were raining into the streets of Fort-de-France, and the inhabitants had either taken refuge on the ships in the harbor or had fled into the mountains south of the city. Many had found means of transportation to other islands.

"While making the trip from Martinique the Helga encountered seas that almost swamped her. There is little wind blowing, but the ocean is disturbed by some convulsion beneath the surface."

From St. Pierre the relief expedition sent from Bridgetown, Barbados, the day after the disaster, returned, bringing tales of horror. Dr. C. J. Manning, who went on the Solent, gave this account of what he saw: —

"We knew before leaving Bridgetown that the disaster at St. Pierre was one that had shocked the world, but we were not prepared for what we found. Steaming into the roadstead, we saw the entire city in ruins, with no sign of life about the place. Smoke was rising from the blackened walls, and ashes sifted down upon the deck of the Solent.

"As we neared the shore, the wrecks of nine ships were seen, besides the Roraima, which was still smoking. The sides of the Roraima were still hot, and as the water lapped against her it sizzled and steam arose. On the deck were two swollen and blackened bodies.

"We found all the large fig trees near the beach uprooted. Some with the roots uppermost were without a leaf left on them. The boughs were snapped off, and scattered all over the landing place. We noticed that one house had fallen in and the ceiling laths were twisted all in one direction, just as one might twist a handful of straws. This seems to point to the fact that the sudden escape of so much heated air from the volcano at the time of the great explosion caused a sort of whirlwind, which tore up the trees by their roots.

NO SIGNS OF EARTHQUAKE.

"There was no sign whatever of there having been a great earthquake, as there were no cracks or fissures on the esplanade, or anywhere else. Smoke and flame were to be seen in various parts of the town, and far above our heads the volcano was sending out dense masses of black smoke. The Cathedral was smouldering, and here and there we passed houses still aglow and smoking.

"Wherever we turned there were dead bodies to be seen, scorched, blackened, hideous. The greater number were on their faces, some with their heads between their hands as if to avoid the stifling vapor which suffocated them.

"Lying on a deck house that floated to the shore was a body which we believe was that of Captain Muggah, of the Roraima. Not far away lay a magnificent specimen of a man, evidently a sailor who had perhaps floated ashore on wreckage, believing that he had escaped the dangers of the burning ship and was safe. He had pulled his jumper over his head to avoid the suffocating fumes, but all to no purpose. Not one living soul had escaped.

"Just around a corner from where the body of the sailor lay were sixteen bodies in a heap. All must have been running to escape death and were overpowered in the twinkling of an eye.

"There was the body of a slender girl, hardly in her teens. Just beyond her lay the bodies of two, evidently mother and daughter, their hands tightly clasped.

STRICKEN WITH SUDDEN DEATH.

"Showing how sudden death had come upon them, there was the body of a boy who had just thrust a crust of bread into his mouth. Death had stricken him as his teeth crunched upon the bread. He fell without suffering.

"A little further down the street were the horse and buggy belonging to Mr. Barnes, manager of the bank. The horse had tucked its head under its body in a vain effort to escape the deadly fumes.

"Everywhere was the same awful story of destruction and death. Side by side lay a young woman and a mother who had clasped her babe to her breast and had knelt over it, hoping, no doubt, to save its life, though death came to her.

"A report from St. Vincent states that in one house were found the bodies of thirty-two persons. One man was sitting by a table with a pipe in his mouth, and a little child had its tiny hand outreached in the act of grasping a toy. All wore the most natural expression of countenance, so quickly did the death stroke accomplish its work.

"The new eruption of Mont Pelée is greater than that which destroyed St. Pierre, and all in Fort-de-France are filled with panic. The island has been shaken by the workings of the forces within

the earth, and every one awaits in fear a cataclysm even worse than that which only recently filled the world with horror and consternation.

"Monday night was one of terror and alarm here. The earth seemed to have lost its foundations. Up through the crater of Mont Pelée poured a storm of death. Yesterday there occurred an explosion so terrible that walls in this city were shaken down and the people were wild with fear, anticipating the fate of the residents of St. Pierre. They deserted their houses, and with frenzied cries rushed into the streets, making their way with all speed to the waterfront to get boats to take them anywhere into the open sea to escape the impending danger. Many of them carried household effects in their arms, while others ran about wringing their hands and crying. There were many vessels in the harbor, but they would not send boats ashore.

DOWNPOUR OF ASHES.

"Smoke fills the air, darkening the sky. Ashes are falling steadily. When the heavens are filled with lightning, as frequently happens, it can be seen that Mont Pelée has not ceased to throw out a great column of lava and stones. There has been a perfect calm in the air, yet the waters of the Caribbean are lashed to a fury, indicating that the same forces that cause the volcano to labor are working tremendous changes at the bottom of the sea. Words are inadequate to describe the actual conditions. Disaster is expected at any moment, and in the harbor every ship has steam up, and is ready to slip cable and speed away.

"The cloud which issued from Mont Pelée was composed of cinders. It is estimated that 20,000 people rushed out into the streets of the town, shrieking and praying. A tidal wave has destroyed a portion of the village of Le Carbet. Carbet is a southern suburb of St. Pierre. It had a population of 6,000. South of Carbet is the Piron de Carbet, a volcanic mountain 3923 feet high. Precheur, with a population of 4,000, is four and a half miles northwest of St. Pierre."

Letters from victims of the volcanic disaster arrived in Paris

in great numbers. They form a unique series of documents, filled with human interest for future historians of the catastrophe. A Marseilles merchant received a letter from a married sister in St. Pierre, dated May 4, in which she wrote :

"I write under the gloomiest impressions, though I hope I exaggerate the situation. This unchaining of the forces of nature is horrible. Since last month I have wished myself far from here. My husband laughs, but I see he is full of anxiety and is trying to show a brave face in order to raise my courage. He tells me to go. How can I go alone?

"M. Guerin says the women and children should flee as from an epidemic, but that the men, especially those situated like my husband and himself, must stay, as otherwise it would cause a general panic. All this is very sad. The heat is suffocating. We cannot leave anything open as the dust enters everywhere, burning our faces and eyes. I have not the courage to attend to the necessary household duties. Fortunately we have preserved food but we have no heart even to eat. All the crops are ruined. It is always thus in these accursed countries. When it is not a cyclone it is an earthquake, and when it is not drought it is a volcanic eruption."

NEW VOLCANOES.

New volcanoes have been created in the Caribbean country by the tremendous forces at work there. Captain Morton Hanson, of the Talisman, which arrived in New York harbor from Barbados, reported that a crater had opened on Diamond Rock, an isolated island off the southern end of Martinique. He says :

"We left Barbados on May 12th, and that night passed around the southern point of Martinique. As we passed Diamond Rock I saw a sheet of flame flare out from the side. At first I thought it was a steamer burning a signal. We waited until daylight when we could see that fire was issuing from a recently formed crater. There was much smoke, but no ashes or lava. I ordered the Talisman as close in shore as I dared go. Through seething water we went until the rock was not more than a quater

of a mile away. There could be no doubt of the nature of the phenomenon.

"When we passed St. Pierre, Mont Pelée was still showing great activity. We were about a mile from the shore. The sky was dark and a pall was spread over the ruins of the city. Off Fort-de-France I saw several warships at anchor, each with steam up and ready to put to sea at the first sign of disaster.

"The destruction that had been worked on the island was something to make the heart sick. I passed the island only a few days earlier, and at that time the stretch from St. Pierre to Carbet was a beautiful piece of country. Suburban homes nestling into the green verdure made it a paradise on earth. When I returned the paradise had changed into a region closely resembling the inferno. I shall return to the West Indies as soon as my cargo is unloaded, but the islands can never again appeal to me."

Another ship that arrived—the Alessandro del Bruno, Captain Antonio Murza—passed close to St. Pierre on May 11. Captain Murza saw a number of bodies floating about the bay. One small steamer outside was crowded with persons who he supposed were survivors rescued from the neighborhood. His ship on the afternoon of May 7 passed through a blinding storm of lava dust and sulphur fumes.

SAW MONT PELEE IN FULL ERUPTION.

When the New York Herald's tug, the M. E. Luckenbach, passed St. Pierre, Monday, May 19th, on its way back to San Juan, Porto Rico, Mont Pelée was in violent eruption. A column of ashes was reaching far into the sky, and stones were raining down upon the ruins of St. Pierre. For ten miles out to sea the air was so thick with ashes that all on the vessel were compelled to remain below deck to breathe with any comfort.

Barbados' remarkable experience with volcanic dust on May 7 and 8 was related in mail advices from that island. It was about mid-day on the 7th when loud reports, as of distant cannonading, were heard from the west. The reports were repeated every fifteen

or twenty minutes, and far out to sea several sharp electrical flashes were seen, a large, dark mass began to rise like a heavy cloud, gradually spread, became intensely hot, and the sky took on a murky appearance as on a gray September day.

A sudden rise of two feet in the water of the Carernage and harbor took place about half-past three o'clock, and then as suddenly subsided. Experts at once knew that a seismic disturbance was occurring in a neighboring island, and soon afterward it became known that La Soufriere, in St. Vincent, had burst into activity.

By a quarter past four o'clock it had become very dark. The mass of clouds had spread over almost the entire sky. Electric flashes were to be seen far out to the westward, and an occasional flash overhead. Everywhere in the streets persons gathered to watch the heavens. By five o'clock it had become so dark that lamps had to be lighted, cocks began to crow and those still cloud gazing were covered with small gritty dust. Many hoisted umbrellas to prevent the dust getting into their eyes.

BLACK AS MIDNIGHT.

At six o'clock it was as black as midnight, and belated travelers had to obtain lanterns to see the way before them. Many persons had to sleep where the darkness caught them. Flashes of lightning continued until half-past nine, accompanied by peals of thunder.

When morning broke dust was everywhere, on roads, grass and trees. What the evening before was a pretty little rosebush with bright green foliage and crimson flower, now seemed a dismal gray shrub. Clouds of dust were still whirling through the air, and one could hardly see more than two hundred yards ahead. On every side people began to clear the dust away from their doorsteps and roofs. This continued most of the day, but by mid-day the dust storm had stopped. Evening brought plentiful showers, which laid the dust on the roads.

From Kingstown, Island of St. Vincent, Monday, May 19th, came this account: "Another great eruption of La Soufriere vol-

cano took place last night, and to-day there is an alarming report from a creditable source that Enham Mountain, near the Marriaqua Valley, an old and apparently extinct crater, is showing signs of activity. This volcano is only about six miles from Kingstown.

"Throughout Sunday the districts adjoining La Soufriere trembled violently, some shocks being felt here. Smoke issued from the craters and fissures of the mountain, and the atmosphere throughout the island was exceedingly hot. While worshipers were returning from church at half-past eight o'clock, in the bright moonlight, a luminous cloud suddenly ascended thirty to forty miles in the north of the island and drifted sluggishly to the northeast.

"Incessant lightning fell on the mountain, and one severe flash seemed to strike about three miles from Kingstown. Thunderous rumblings in the craters lasted for two hours, when they diminished until they became murmurings. The rest of the night was clear. Ashes fell from ten o'clock until midnight.

PEOPLE PANIC STRICKEN.

"The inhabitants were panic stricken by the outbreak, fearing a repetition of the catastrophe which overwhelmed the Caribs. They ran from the streets into the open country, crying and praying for preservation from calamity. No one on the island slept that night. In the districts near the volcano the rumblings of the craters were appalling, and streams of lava flowed down the mountain side.

"Villagers from Chateau Belair and Georgetown are pouring into Kingstown, this being the furthest town from the Soufriere. The Royal Mail steamer Wear also is bringing refugees from Chateau Belair. Kingstown is now congested, and the demands on the government are increasing rapidly as more and more persons are obliged to leave their homes. A thick, smoky cloud now overspreads the island. All business is suspended and the streets are empty. Every one is filled with fear of the future. The feeling of suspense is intense. The people pass their time gazing at

the northern sky, where the thunder clouds gather and the mournful roaring of the volcano is heard. Ashes and pumice are falling slowly in the out districts."

This account was forwarded from St. Thomas, May 21st:

"A report from the Island of Dominica says that at 5.30 o'clock yesterday morning a curious awe-inspiring fiery cloud, surmounted by a fleecy white cap, resembling highly polished silver, was seen from Roseau (on the west coast of Dominica) on the southeast. This phenomenon caused alarm in Dominica, especially as lightning followed in its wake. So rapidly have the horrors of the last fortnight piled upon one another that it now seems ages since the first news was received here. Meanwhile the terrible news continues, and the people in St. Thomas fear that other and greater explosions are to come.

SMOKE AND RUMBLING SOUNDS.

"It was Saturday, May 3rd, just ten days ago, that the first cablegram received from Martinique announced the activity of Mont Pelée, and gave warning of the disasters that were to follow. St. Thomas learned that Pelée had been threatening for ten days, and that on May 2nd, it had begun serious operations. Volumes of smoke issued from the mountain, accompanied by rumbling noises. At midnight flames had been seen.

"All in the neighborhood of the volcano were in a state of consternation. Some took the warning and left St. Pierre, but the great proportion of the dwellers in the city remained to meet their fate. The next day (Sunday) ashes began to fall, and thereafter business in the city was practically suspended.

"It is worthy of note that the flames were first seen to issue from the old crater, which had for a century been filled by a lake of great depth. The question will be asked, 'What became of the water that was in the lake?' Scientists here believe that it was when this water reached the slumbering fires beneath that the explosion occurred. It can well be understood what an explosion would occur under such circumstances. It would account for the sheet of hot air that was followed by fire and then by ashes. It

would explain how the inhabitants were suffocated before they could realize the peril that was upon them."

Professor C. Willard Hayes, Chief of the United States Geological Survey, said it was a matter of vast moment to the people of Martinique to know what the volcano of Pelée holds in reserve for them. Is the eruption which obliterated St. Pierre only the beginning of a series which are to eclipse it in violence or has it done its worst?

Prediction, especially at this distance, where actual conditions are as yet very imperfectly known, would be extremely rash. A consideration of other great eruptions, however, shows that so far as known all have a general similarity. Being the product of the same forces they have the same characteristics, except as they are modified by local conditions.

STEAM ESCAPES THROUGH CRUST.

The generally accepted explanation of volcanic phenomena is that water gains access to the heated interior of the earth, and, being there converted into steam, seeks to escape through the rigid rocks of the outer crust. The force of the expanding steam slowly accumulates, and when it reaches a point beyond the strength of the confining strata an explosion takes place. This affords relief, and the confined steam escapes with gradually decreasing violence. This theory is in strict accord with all eruptions which have been carefully observed and recorded.

A volcanic eruption may usually be divided into three well marked phases. First, there is a period which may cover several weeks or even months, characterized by earthquakes of more or less violence, with subterranean rumbling and the escape of some vapor, possibly accompanied by the opening of fissures and the extrusion of small amounts of lava. This is the period in which the expansive force of the confined water and the strength of the overlying rocks are very evenly balanced.

In many cases no eruption follows, the steam being unable to lift the overlying strata before its force is gradually dissipated. If, however, the force of the expanding steam continues to increase,

the limit of strength of its barriers is reached and a sudden explosion takes place. The solid surface rocks are shattered into fragments, and the intensely heated rocks at great depths are carried upward by the expansion of the enclosed water.

CULMINATING POINT OF ERUPTION.

This is the second phase of the eruption and usually marks its culminating point in violence. It is much the shortest of the three, generally lasting at most only a few hours, but it is in this brief period of extreme violence that most of the destruction is usually wrought.

Following the culminating explosion there is usually a short period of comparative quiescence, followed by a second explosion similar to the first, but less violent. This in turn yields to a second quiet period. This is the third phase of the eruption.

The vent once formed, a smaller accumulation of steam serves to force its way to the surface, and hence the successive explosions are on a decreasing scale of intensity, both because the supply of explosive is gradually exhausted and also because with each explosion the resistance to its escape grows less. This period of waning activity may last as long a time as the premonitory period. The explosions become gradually weaker and less frequent until the volcanic activity is entirely extinct.

This third phase is, like the others, characterized by earthquakes. Enormous quantities of rock are blown out by the explosions, generally in the form of dust, which is scattered far and wide by air currents. This leaves great cavities and extensive areas of the surface are sometimes engulfed by the falling in of these tops. In this way the caldera, or so-called crater lakes, which are frequent in volcanic regions, are formed.

It will thus be seen that the earthquakes which precede and follow an explosive eruption, while both may be equally destructive, are due to different causes. Those which precede the eruption are caused by the rending of the rocks by the expanding steam, while those which follow are caused by the readjustment of the surface to the alterior subterranean conditions.

I think, therefore, that the danger which now threatens the ill-fated island is not from a renewal of explosive eruptions from Mont Pelée—although exceptions of decreasing violence will doubtless continue for some time—but from violent earthquakes and the sinking of the surface near the volcano. There is, however, little danger of these extending over any considerable portion of the island.

It is extremely fortunate for the science of volcanology and for the future welfare of people living in volcanic regions, that a group of eminent scientific observers is already on the ground, prepared to study this eruption while the evidence of the stupendous forces which have been active is still fresh. It is an opportunity to advance scientific knowledge of these forces such as is rarely afforded. With increasing knowledge come increasing possibilities for safeguarding human life, and it is quite within reasonable expectation that enough will be learned to render a catastrophe, such as we have just witnessed, impossible in the future.

LARGE DONATIONS FOR SUFFERERS.

Gratifying reports came from all parts of our country, showing that the great disaster had touched the hearts and awakened the spirit of liberality among people everywhere. Human sympathy wiped out the thousands of miles that separate Chicago from the Island of Martinique, and about the American's relief headquarters there were many evidences of the warmth of feeling for the sufferers by the volcanic eruption that overwhelmed St. Pierre.

The quarters at 117 Monroe street were visited by hundreds of people, nearly all of whom brought something to express in material form the generous promptings of their hearts. Rich and poor made the headquarters a Mecca, sought on a mission of charity. Merchants sent drays with bales and packages of provisions, laborers offered their mite in money; all were impelled by the one desire to relieve the suffering of the people, and do it promptly.

Most of those who called personally in the early morning or

later in the evening were men who would be compelled by the draft on their resources to deny themselves something at home. Most of these were as ready with expressions of sympathetic regret and hope that the poor people on Martinique might not starve before relief could be got to them as they were to give their contribution.

Merchants of every degree made more substantial contributions with the same hearty good will. The scene about the headquarters was one of great activity, the contributions of provisions being at once made ready and sent off.

Already a great amount of the necessaries of life was received and sent away. Money was cabled to the ports nearest to the stricken districts. The supplies shipped from St. Thomas on cabled instructions were already in the hands of the famishing ones. The provisions diverted to Fort-de-France by Armour & Company, averted some of the threatened horrors of famine.

CHAPTER XV.

WOMEN AND CHILDREN HEMMED IN BY TIDE OF LAVA.—FACE TO FACE WITH A TERRIBLE DOOM.—EXPEDITION TO MONT PELEE.—CHILD'S PATHETIC TALE.

ADDITIONAL accounts, vividly depicting the disastrous volcanic outbreak, were received from West Indian journals that reached New York May 22d, confirming all that had hitherto been stated concerning the overwhelming catastrophe. The Voice of St. Lucia, printed at Castries, had this story on May 8 of the days preceding the destruction of St. Pierre:—

"Mont Pelée began to show signs of uneasiness in the last days of April. On the third instant it began to throw out dense volumes of smoke, and at midnight belched out flames, accompanied by rumbling noises. Flames were again visible at half-past five o'clock the next morning, and similar noises were audible. At the foot of Mont Pelée are the villages of Precheurs and Ste. Philomene. The inhabitants were thrown into great consternation by the sights and sounds, and especially by the darkening of the day by volumes of thick smoke and clouds of ashes, which were falling. There was an exodus from all over the district.

"St. Pierre was on the morning of May 3 covered with a layer of ashes about a quarter of an inch thick, and appeared as if enveloped in a fog. The mountain was wrapped in the smoke which issued from it. The greatest anxiety prevailed, and all business was suspended.

"A very anxious morning was passed on the island May 4. Thanks, however, to a sea breeze, the situation appeared better at eleven o'clock, but as the breeze died away at sunset, ashes again began to fall, and the mountain and its environs presented a most dismal spectacle, causing much alarm as to what the night would bring forth. Nothing happened, however, and on Monday morning, May 5, although everything was not quite serene, the aspect was decidedly encouraging. Less excitement was visible.

"At about nine o'clock on the morning of the sixth a private telegram came from Martinique, stating that the Plissonneau family had chartered the steamer Topaze, one of the boats of the Compagnie Girard, and had started for St. Lucia. At about eleven o'clock the Topaze arrived with Mrs. Plissonneau, Mr. and Mrs. Joseph Plissonneau and three children, Mrs. Pierre Plissonneau and child, and others.

LAVA RAN ONE HUNDRED MILES AN HOUR.

"They report that at noon on Monday a stream of burning lava suddenly rushed down the southwestern slope of the mountain, and, following the course of the Riviere Blanche, the bed of which is dry at this season of the year, overwhelmed everything which obstructed its rush to the sea. Estates and buildings were covered up by the fiery wave, which appeared to rise to a height of some twenty feet over an area of nearly a quarter of a mile.

"When the torrent had poured itself into the sea, it was found that the Guerin sugar factory, on the beach, five miles from the mountain and two from St. Pierre, was imbedded in lava. The burning mass of liquid had taken only three minutes from the time it was first perceived to reach the sea, five miles away.

"Then a remarkable phenomenon occurred. The sea receded all along the western coast for about a hundred yards and returned with gentle strength, covering the whole of the sea front of St. Pierre, and reaching the first houses on the Place Bertin, This created a general panic, and the people made for the hills. Though the sea retired again, without great damage being done ashore or afloat, the panic continued, intensified by terrible detonations, which broke from the mountain at short intervals, accompanied with dense emissions of smoke and lurid flashes of flame.

"This was awful in daylight, but when darkness fell it was more terrible still, and, at each manifestation of the volcano's anger, people, in their night clothes, carrying children, and lighted by any sort of lamp or candle they had caught up in their haste, ran out into the dark streets, wailing and screaming, and running aimlessly about the town.

"The mental strain becoming unendurable, the Topaze was got ready, and the refugees hurriedly went on board and started for St. Lucia. In the afternoon the gentlemen of the party, having placed their families in safety returned by the Topaze to Martinique.

"In the meantime, telegrams were being sent from Martinique, imploring that a steamer be chartered to bring away terrified people from St. Pierre. But the superintendent from the Royal Mail Company, at Barbados, would not allow one of the coasting boats, the only steamer avilable, to go to Martinique At a little before five o'clock in the afternoon cable communication was interrupted and remains so."

On May 21st this description was furnished of the horrible conditions prevailing at Fort-de-France:

NOT DESTITUTE, BUT TERRIFIED.

"Streams of frightened refugees have been pouring into Fort-de-France from all the surrounding country. These people are not destitute, but they are terrified. They want only one thing, and that is to be taken far away from this island, with which they say the gods are angry, and which they will destroy by fire before it sinks under the sea. The Consuls here and the officers of the war vessels in the harbor are waylaid by scores of persons crazed with fear and begging to be carried away.

"The weather is now calm and beautiful, but the mountain is veiled in volcanic clouds, which often assume a very threatening aspect, and occasional rumblings are heard. Some heavy and very welcome rain fell this morning.

"The United States steamer Dixie, Captain Berry, from New York, arrived to-day, after a quick and safe passage. Her passengers include many scientists. Professor Robert T. Hill, Government geologist; Professor C. E. Borchgrevink, the Antartic explorer; Messrs. George Curtis and George Kennan and many magazine writers and correspondents are also among those who arrived on the steamer.

"The Dixie began landing her enormous cargo of supplies

early, and the storehouses on shore soon became congested. This is the greatest difficulty of the administration.

"This morning the United States steamer Potomac, with the commanders of the war vessels now here, went to inspect St. Pierre. With the greatest difficulty the party succeeded in making a landing. The effects of the outburst of yesterday were tremendous. The huge basalt towers of the Cathedral were pulverized and the walls were hurled flat to the earth. The bombardment of volcanic stones is not sufficient to account for this, and all evidences point to the passage of a furious blast of blazing gas, traveling at enormous speed and incalculable force.

NO LIVING WITNESS OF THE DISASTER.

"The deposit of boulders, ashes and angular stones is enormous. Not a living human being saw what happened at St. Pierre yesterday morning. This second eruption was many times more violent than that which effaced St. Pierre and swept its people from the earth. Nor has all volcanic activity ceased. Vast columns of smoke and gas still pour from the great crater. New fissures have opened on the mountain sides and are vomiting yellow whirlwinds, which rush intermittently, now from one point and now from another. Boiling mud is also thrown out at times in torrents that reach the sea and produce small tidal waves.

"From a sombre, silent city of death and desolation, St. Pierre has become a hideous amphitheatre of fiery, roaring destruction. The people are convinced that God is angry with the island and means to scourge it with fire and then sink it in the ocean. Utter and unreasoning fear possesses all souls. Even Fort-de-France is believed to be unsafe. The presence of the relief ships, however, are helpful to the people, who say 'the American flag makes safety.'

"The Potomac could not approach close to St. Pierre. The Dixie will sail to-morrow for St. Vincent, but the other vessels will remain here. The scientists who have arrived will examine into the question of the danger of the peaks of Carbet, near Fort-de-France becoming active volcanoes. The outbursts of yesterday

probably mean a ruined island, as all confidence is lost. 'We want not food, but only to leave,' is the cry of all, rich and poor alike.

"Mont Pelée continues to menace the existence of the entire island of Martinique. Without cessation, it has been in eruption since Monday, the eighteenth of May. A new crater has opened on the north side of the volcano, and from this lava pours in a broad stream down to the sea. This crater is probably the result of the terrific explosion that occurred early Tuesday morning when the pent up force seemed to rive the mountain from base to summit.

"It is now known that there has been further loss of life, and, what is more distressing, a large number of persons, mostly women and children, are imprisoned by the lava streams which surround them. It is impossible for assistance to be rendered to them by human beings, and nothing less than a miracle can save them from the awful death which confronts them.

ALL ESCAPE CUT OFF.

"These unfortunates are at Grande Riviere. They were cut off from escape when Mont Pelée resumed its labors, Monday, the 18th. The lava that burst from the volcano swept away all the road, filled the river channels so that it set the bridges afloat, carrying them upon its surface until they were consumed, and, reaching the seacoast, spread through the crevasses a bubbling mass, so hot as to be almost incandescent.

"In this way have the women and children at Riviere been surrounded. Efforts have been made to reach them, and though they can be seen pleading for deliverance, it is impossible to give them aid. Their supply of food is limited, if not wholly exhausted, and starvation, if not a more terrible fate, confronts them. Gradually, but steadily, the rivers of lava are spreading, and if the eruption increases a wave of molten material will sweep away the doomed victims.

"Usine Vive has been destroyed, as has Le Carbet, where twenty soldiers perished. Many inhabitants of the village are

also believed to have been lost, but it is impossible to tell the number. In all Martinique the conditions are impossible to describe.

"Although Pelée has been growing less ugly for a day or two, it still presents an appearance that is far from reassuring. Gun-like reports are heard at irregular intervals, and after each report the mountain top trembles, while some cleft in the summit pours forth a fresh stream of lava. Believing that the island is doomed, the population continues in a state of pitiful panic. Just as fast as possible they are leaving on ships. They do not care where they go. All that they ask is a means of leaving the place they have come to regard as an inferno.

"Six hundred refugees have arrived here on the Salvador. Two hundred more are expected soon. Those who are here are in a sad state of poverty. Many are almost naked, and not one has brought more than the clothes he wears. Among the homeless ones are many too old or too young to care for themselves. Some are orphans, whose parents were victims to the rage of Pelée. A relief committee has been formed here, and the authorities are doing their utmost to relieve the distress.

"Free rations have been distributed, but the supply will not last long. It is probable that some of the provisions intended for Martinique will come here.

"Fears are prevalent that a pestilence will result from the bodies that float ashore on all the islands. Scores of burned and lacerated bodies have floated ashore on Marie Gallante Island, south of here. They are being buried, and precautions have been taken to prevent an outbreak of disease."

DARING EXPLORATION OF MONT PELEE.

The correspondent of the Associated Press at Fort-de-France had an interview with M. Clerc, a member of the Legislature of Martinique, who explored the vicinity of Mont Pelée. He said:

"I started Friday last, May 16th, for Mont Pelée by the road leading along the coast from Basse Pointe, and, accompanied by M. Telliame Chancel, chief engineer of the sugar works, I reached

a height of 1235 yards without difficulty, and was able to ascertain that the present crater is about 300 yards in diameter. On the east it is overlooked by the Morne la Croix, the culminating point of the island, having an altitude of 1350 yards, which is completely crumbled and mined at its base, as a result of the volcanic action, and might easily collapse. The Morne Petit Bon Homme has an incandescent aspect.

"In order to make known our presence at the point where we stood, I waved a piece of white cloth, attached to a stick, in the air, which was replied to by a corresponding signal from an inhabitant of Morne Rouge, who signaled to me in this manner, in order to show that he saw us.

VOLCANO CHARGED WITH ELECTRICITY.

"We felt a number of electric commotions, and our shoes were damaged by the heat. The pond which was situated near Morne La Croix is completely dried up. The iron cross, which stood at the foot of the mountain, has been melted. Only the base of the masonry, on which the cross stood, and the lower part of the foot of the cross can be seen.

"The rims of the crater have very much changed in appearance, and the heat where we stood was intense, and the whole aspect of the mountain was terrifying. Stones fell around us, and we picked up large pieces of sulphur, which, however, we were unable to retain. The whole spot was charged with electricity, which became so violent that we were obliged to retreat.

"Our descent from the mountain was more difficult than our ascent. A blinding rain of ashes fell upon us, and the engineer was nearly killed by a large stone which fell near him. We succeeded in reaching Basse Pointe on our return, after having been four hours on the mountain under the most dangerous circumstances."

The rain of ashes and volcanic rock which fell at Fort-de France caused so much consternation among the inhabitants that those who had not left the city were anxious to do so, and large numbers were emigrating to the Island of Guadeloupe, where,

it was estimated, 1200 people from Martinique had already sought shelter.

During her last exploring trip about the island the French cruiser Suchet, which did not stop at St. Pierre, noticed that all the formerly cultivated land between Grand Riviere and Marigot had been completely destroyed. The inhabitants of those two towns suffered and were still suffering a great deal, but they had not yet determined to abandon those localities, and efforts were being made to supply them with provisions.

The Suchet also reports that as she approached that part of the island where the land was in a better state of preservation, especially between Macouba and Lorraine, a shower of stones and sulphur caused those of the population of Morne Rouge who had remained there to hastily evacuate that place. For a time some apprehension was felt regarding the safety of the detachment of French troops quartered at Le Carbet, but there was no loss of life among them, according to reports. The French gunboat Joffroy took on board about 150 of the inhitants of the neighborhood of Le Carbet. It was estimated that about 3000 persons had left Fort-de-France for the extreme southern part of the island.

CHILD'S PATHETIC TALE.

In the city hospital at Fort-de-France were eight survivors of the Mont Pelée disaster—those who were rescued from the steamer Roraima. Among them was the little 9-year-old Brooklyn girl, Margaret Stokes. She presented a most pathetic figure. The child was terribly burned. The end of her nose was burned off, and her face was disfigured. Both arms, too, were fearfully burned. She was greatly distressed over the loss of her parents. She is all alone in the world now.

"I lived at 349 Twelfth Street, Brooklyn, with mamma," little Margaret said. "We came away from there in the ship and were going to Barbados, where mamma was born. On the morning of the awful fire from the volcano we were at breakfast on the Roraima when something knocked us out of our seats. I caught hold of mamma's dress and she took me in her arms and carried

me out on deck. Fire was falling all around us and mamma tried hard to keep the fire from falling on me. She fell down and then some men picked her up and carried her away. Miss King, my nurse, held me while the men fought the fire and tried to keep the ship from burning up. Then a big boat came, and we were taken off. I don't want to die—I hope I am not going to die, but, oh, I want my mamma—I want my mamma."

The only friend the child has is the nurse, Miss King, of Barbados. Miss King is a quadroon, but is a very capable woman. She does not know what to do with little Margaret. The doctors say the little girl will recover. The nurse, who so bravely protected her little charge, was very badly burned.

There were terrifying sights in the military hospitals at Fort-de-France. Several men were literally burned to pieces, but were still living. The whole side of the face of one man was gone, but his sight was still preserved.

Among the patients in this hospital were Charles C. Evans, of Montreal, and John G. Morris, of Brooklyn, who were both firemen on the Roraima. They were terribly burned, but were bearing their suffering bravely. Their bodies were scarred and seared by the red-hot volcanic dust. However, they will always have the proud record of having saved little Margaret Stokes. Her nurse said to me in speaking of these men and of the other Americans on the Roraima:

"The Americans showed no fear. If the natives had helped as they did we would have saved the ship."

CANADA AIDS ST. VINCENT.

Mr. Joseph H. Choate, the United States Ambassador to London, has informed the State Department that a cablegram from the Governor of Windward Islands to the Colonial Office reported that the Canadian government had made a substantial effort toward the relief of the distress in St. Vincent by supplies of money or in kind.

Canada also would supply the bulk of the timber required for rebuilding the destroyed homes. The government of the United

States, so Lord Pauncefote was informed, would give ready facilities for the purchase of timber and expedite its shipment.

This last reference was supposed to mean that the tariff regulations would not be allowed to stand in the way of the shipments of Canadian timber through the United States to ports where it will be taken aboard ship and conveyed to St. Vincent.

The writer received a letter from St. Vincent dated the 28th of April, in which was no mention of any terrestrial disturbance; but a week later, it is said, the island was shaken by earthquakes, those seismic precursors of volcanic eruptions, which seem to have been lacking from the Martinique disaster.

The Soufriere had a large lake entirely filling its larger crater, one of the most beautiful bodies of water in the West Indies, and a thousand feet below the crater brim. The Soufriere was about twenty-five hundred feet in height, from sea level to crater brim; but has probably lost much of its altitude since the explosion.

FATALITY AMONG CARIB INDIANS.

The loss of life reported from St. Vincent is mainly among the Carib Indians, two communities of these people—the last descendants of the original cannibals discovered by Columbus—living on the slopes of the volcano.

More steam than smoke has issued from the Soufriere, but the ashes and lava flow will compare in volume with the same from Pelée. The volcano labored heavily to rid itself of the vast volume of water contained in the lake, thus giving rise to immense vapor clouds, which rose, it is said, eight miles into the air, in shapes suggestive of gigantic wheels, flowers and ferns, played upon by flashes of lightning from beneath. Vast physical changes are being effected in the Soufriere district, among them being the breaking down of hills and the filling of valleys, the wiping out of fertile sugar land and the overflow of lava rivers. A dozen new streams have been traced, and there were already in the island, half as many of the so-called "dry rivers" existing from the previous eruption.

Martinique had a population of about two hundred thousand,

at least nearly one-fourth of which was destroyed in a few moments. St. Vincent is a smaller island, being only eighteen miles long, with an area of not over one hundred and forty square miles and about forty thousand inhabitants. It is one of the most beautiful islands in the West Indies, perhaps in the world—a tropical paradise; but the most of its inhabitants are wretchedly poor, like those of other islands where picturesque scenery abounds, and this latest dreadful happening, by destroying the best sugar and provision lands, will produce a famine and complete the work of destruction begun by earthquakes and hurricanes.

It is now a good many years since I first looked upon Martinique, approaching it through the channel between that island and Dominica, and the impression received of the first tropical land I had ever visited is as vivid to-day as it was then. My first view is a long time to look back upon, but no one who has seen the north end of Martinique, with the black, frowning mass of Mont Pelée rising from the sea, its base wreathed in tropical vegetation, its denuded peak peering through evanescent clouds rolled up from the ocean by the ever-blowing "trades," can forget the picture.

A PROMINENT PEAK.

Pelée, in fact, is the dominate note in that picture, rising as it does above a congeries of minor mountains, its four thousand feet of bulk giving it prominence. Referring to my notes of that time, I find it alluded to as an extinct, at all events quiescent, volcano, whose last sporadic eruption, when it threw out smoke and ashes only, occurred thirty years before.

Approaching the island from the Atlantic, the "windward" side, the volcano appeared as a mass of dark-green with a serried outline, cleft into ravines and black gorges through which ran swift-flowing rivers almost innumerable, gushing from internal fountains and seeking the sea.

Rounding the northern end of the island, of which Pelée is the outpost, we sailed from the rough waters of the Atlantic into the smoother seas of the Caribbean, the hills and mountains at once affording a lee, and the beautiful flying-fish, hundreds of

which had skimmed the crest of the Atlantic waves, now disporting by thousands. The great basaltic cliffs, which towered above crescentic, palm-bordered beaches of golden sands, cut off the breeze, and our sailing vessel scarce had wind enough left to make the roadstead of Martinique's commercial port, St. Pierre.

The trade winds still blew, however, strong and moisture-laden from the windward coast, as evidenced by the pattering showers educed by condensation against the mountain sides, and a glorious rainbow spanned St. Pierre's mile-long bay from northern to southern headland, bathing the picturesque city, tier upon tier of white-walled houses topped with ferruginous tiles, in a golden mist.

It may be owing to the fact that St. Pierre was the first tropical city I had ever seen that it appeared to me the most fascinating; but of a truth it possessed many quaint charms all its own. It occupied a narrow belt of shore between high, cliff-like hills and the strand, its stone-walled houses, white, red, yellow, terra-cotta, solidly embanked along the shore and, higher up, scattered in picturesque confusion among clumps of tamarind and mango trees, with here and there tall palms waving their fronds aloft.

It very much resembled the city of Algiers, minus the mosques and the Kasba, but plus the palms. Algiers, as I saw it first, beneath a full-orbed moon, impressed me as the most beautiful city I had ever looked upon, but I think that if St. Pierre had not been so closely compressed between the encroaching hills and the sea it could well have vied with the African city. Still, nothing could compensate for the loss of that magnificent wall of living green which served as the background for St. Pierre's architecture.

IN LOST ST. PIERRE.

I cannot but admit that the city was disappointing at close view, for the most of the buildings were quite tropically disregardful of appearances, being without windows or chimneys, of course, and made of conglomerate materials. Nature had done much—in fact, everything—for the commercial entrepot of Martinique;

man had made a few feeble attempts at adornment. The streets were narrow, save along the sea-front, where there was a broad quay paved with basaltic blocks. The harbor—or, rather, the roadstead, for it lies wide open to the sea—is deep enough to have been the crater of old Pelée itself, all approaching vessels having to run out an anchor at a short distance from the land and then moor by a hawser ashore.

There they lay, their noses pointed seaward, bobbing up and down upon the placid bosom of the Caribbean, with water just outside their berths a hundred fathoms deep. This depth of water is not a peculiarity of St. Pierre roadstead, however, for it is found off Roseau, in the island of Dominica, next adjacent north, off Kingstown in St. Vincent, and especially deep in the harbor of Saint Georges, Grenada, which is indubitably an old crater invaded and filled by the sea.

BEAUTIFUL ST. PIERRE.

Having visited St. Pierre several times since my first arrival there, and having retained the impression that it was a beautiful, though not exactly an attractive, city for residences, I think this must be correct. It is said that old Montagne Pelée probably blew its own head off, through the generation of steam from water that had percolated through its crater-sides. Well, this may be a correct assumption, for certes there is water enough in the island—or there was—and to spare.

The atmosphere is ever moisture-laden, streams and rivulets run everywhere and in all directions, descending from the central mountain masses. The strongest feature in St. Pierre was the abundance of water, running through side channels in its streets at right angles to the quay, overflowing in numerous fountains and oozing out through the soil above the city.

In the beautiful Jardin des Plantes, adjacent to the city, a glorious cascade dropped over cliffs into a basin bordered with palms and tree ferns. But for the water, in fact, the city would hardly have been very desirable to live in; for, as it was, the odors at times were very nearly overpowering, especially in the

wee sma' hours when the domestics threw open the portals of their respective domiciles and bore forth the garbage, which they dumped in the streams flowing through the gutters. They appeared only at appointed hours, the city being as well regulated as any of its prototypes in France; but when they made their exit all the sailor folk in the harbor knew of it, from the noisome odors exhaled.

Later on, about an hour after daybreak, the breakfast dishes were often washed in the clear water running past the "trottoirs"; still later, most attractive babies, variously colored, from ebon and chocolate to café au lait and old gold; but all happy as the morn and shrieking from overplus of joy. Should breakfast dish or baby be released but for a second, down the steep incline it would glide, to be recovered, perchance, only at the shore.

The public buildings of St. Pierre—such as the theatre, the cathedral, bishop's palace, the great barracks for the troops—were all massive structures and in good taste. The "magasins" filled with European products were sufficiently numerous, and the city was well equipped with all the fittings demanded by an ambitious metropolis of the twentieth century.

THE PEOPLE OF THE ISLANDS.

The greater portion of Martinique's inhabitants are black or colored, the African-derived element being vastly in preponderance and increasing year by year. The female colored creoles of Martinique, particularly of St. Pierre, were celebrated for their quaint bizarre costumes, flowing robes of silk or calico, always loose and open and of the brightest colors. The dress most affected by the domestics, hucksters, and even by women of the better class was designed especially for a tropical climate and cut with the waistband well up under the shoulder-blades. It was locally known as the "costume de Josephine," after a tradition that this famous daughter of Martinique adopted it for negligée in the seclusion of La Pagerie.

A love for bright colors and confusion of jewelry is characteristic of the creole, quadroon and octoroon, even the "Sambo"

negress being very particular as to her turban, which must be fashioned of the gaudiest bandannas and ornamented to the extent of her means. She must have coils of beads, gold brooches and pins, and earrings consisting of golden fasces as big as a small baby's fist.

Many of the mixed peoples were handsome withal, and some of the girls who came over from the further side of the mountain, doing their twenty or thirty miles to market and home again every day, were models of symmetry. I used to see them swinging over the country roads with long, easy strides, immense loads of produce, such as bananas, plantains, tanias, piled high upon their heads, their forms erect as lances and their torsos such as might have excited the envy of a sculptor. These people, and in truth all, were contented and happy, prone to laughter, filled to overflowing with an unfailing bonhomie.

THOSE MOUNTAIN MAIDENS.

As I recall in memory these mountain maidens that used to come to town from the windward coast with their burdens of produce, I see their supple forms swaying, their bright eyes and white teeth gleaming, and hear again the ripples of musical laughter and their cheerful "Bon jours" floating on the morning or evening air. They were the brightest of the Martinicans, truly *sui generis*, and it seemed to me that in them the country and the climate had found a perfect type, as suited to the tropics as the mango or the pomegranate.

As I was hunting birds those days, my first voyage to the Lesser Antilles having been in the pursuit of ornithology, I was always more in the country districts than in the city, and so became acquainted with the simple, joyous country folk. They were always willing to assist me, and frequently a man cutting cane in a field would stop his work to show me the haunts of some bird or reptile, or one of the mountain maidens would lay down her heavy load to point out a humming-bird or to warn me of the serpent's lurking place.

It was the "serpent" of Martinique, and the serpent only,

that the natives feared. They gave no heed to Mont Pelée, believing it harmless; but they were ever on the alert as regards the "Fer de Lance," that most venomous of American serpents, which makes its particular habitat in Martinique and the near island of Saint Lucia. It was their one haunting fear, by day and by night, for its bite meant death. The serpent itself was so numerous as to invade the houses even of Saint Pierre and so aggressively venomous as to seek out its victims—in this respect being different from all others of its family.

THE INEFFICIENCY OF PRAYER!

When hunting in the Jardin des Plantes, which was practically within the city limits, and one of nature's beauty spots—with its tall "palmistes," its cascade, its artificial lakes with every variety of tropical foliage mirrored in them—I was alway accompanied by an attendant sent especially to warn me when in the vicinage of the dreaded "lancehead."

In one of my journeyings I made my headquarters at the little village of Morne Rouge, from which I went out on hunting excursions every morning soon after daybreak. I ranged over the hills, such as Morne Calabasse and Morne Balisier, even up and over the slopes of great Mont Pelée, without seeing many serpents, though having several "close calls," my native attendant told me.

The name "morne" is applied throughout the French West Indies to the high hills and low mountains, but not to the greatest elevations; so there are many "mornes" in Martinique, but only one "montagne," that of Pelée, which is further distinguished now from having caused the greatest cataclysm within a century. This mountain was the focal point of all views at the north end of the island, visible all the way from Saint Pierre to Morne Rouge—as one crossed the Riviere Roxelane, where toiled half-naked washerwomen laundering their "washes" with clubs; across the *savane*, the level field where military reviews were wont to be held; through vast cane fields and among luxuriant gardens, ever in view was the Mont Pelée, sweeping grandly up from sea to cloudland.

I used to watch it, together with some of the few French people of Saint Pierre, sitting in the Jardin or on a bench beneath the mango trees not far from the Grande Rue. Twenty-five years ago the white population of the island was relatively numerous; ten years ago I found it lamentably shrunken, and now it must be practically extinguished. First the black flood having its origin in Africa, then the lava flood indigenous in the heart of Pelée, swept the land; now those French-born people, some of them of lofty lineage, are almost extinct.

There is a small bird in Martinique called "l'oiseau de Saint Pierre," because it says, in the patois of the island, "Pierre, priez pour nous; priez pour nous!" (Peter, pray for us; pray for us!) But the prayers (if offered) of the saint, after whom the town was named, were ineffectual as opposed to the wrath of mighty Pelée, which has at last overwhelmed both city and people.

THE CITY BLOTTED OUT.

The annihilation of St. Pierre, the principal centre of commerce in the French island of Martinique, is unique in one particular, so far as verifiable history is concerned. It cannot be pronounced the most destructive of human life among the catastrophes resulting from disturbances of the earth's crust. The number of victims is computed conservatively at nearly 50,000. Considerably fewer lives were lost through the eruption of Mount Vesuvius which overwhelmed Herculaneum and Pompeii, if we may judge from the paucity of human remains discovered.

Considerably more persons perished, on the other hand, in the earthquake which demolished the greater part of Lisbon about the middle of the eighteenth century. What renders the tragedy at Martinique "sui generis" is the appalling quickness with which the work of destruction was completed. Suddenly, about eight o'clock on the morning of May 8, a whirlwind of glowing cinders enveloped the town and the harbor, and in a few minutes all was over. Every living thing within the sweep of the fiery hurricane was scorched, choked and charred.

We repeat that, so far as history, accepted as authentic, is

concerned, there is no record of a catastrophe equally sudden and decisive. For an exact counterpart in this particular we should have to go back to the tradition respecting the lost Atlantis, which was related by Egyptian priests to Plato, and according to which the inhabitants of a great island that once existed in the Atlantic to the west of the Straits of Hercules were exterminated by cyclonic flames attending volcanic eruptions.

If we can regard the legend as embodying a historical fact, this cataclysm occurred thousands of years ago. There would be nothing incredible about the story if, first, we could assume simultaneous eruptions on the part of many volcanoes, each rivalling that of Mont Pelée in intensity, and if, secondly, soundings undertaken for the purpose in the Atlantic should indicate the submergence of a great island in recent geological times.

ELECTRIC DISCHARGES OF TERRIFIC FORCE.

This despatch from Castries, St. Lucia, bore date of May 23d:

"Lieutenant McCormack, who arrived here with the Potomac last night, reports having made an unsuccessful attempt to land at St. Pierre yesterday morning. On the Potomac at the time were the American scientists who went to Martinique on the Dixie under the direction of the Washington authorities.

"Since the more recent eruptions of Mont Pelée the entire aspect of the ruins has changed. Lava has covered the entire city, effacing all landmarks. The place has the appearance of having been entombed for hundreds of years. It will be impossible to make further search until the volcano has finally lapsed into somnolence.

"As the Potomac ran through the roadstead a huge rent was discernible in the south slope of the volcano. From it lava flowed incessantly over the hills to the westward and down into the sea.

"When the Potomac left Fort-de-France that city was still safe, but panic continued among the inhabitants. Ever since Mont Pelée resumed eruption Monday an electric storm has raged. Electric discharges of terrific force have been almost continuous,

and it is feared that an explosion will occur among the hundreds of tons of high explosives stored back of the city. The D'Assas, a French cruiser, with a scientific commission, arrived at Fort-de-France last night.

PEOPLE WANT TO GET AWAY.

"All is quiet at Fort-de-France. The French cruiser Tage is engaged in landing the relief supplies which she brought here from New Orleans. The steamer San Dominique, from Porto Rico, brought here to-day, consigned to Consul Ayme, fifty tons of provisions sent on board that vessel by Governor Hunt in the name of the New York Herald. The vessel also brought 100 tons of supplies from the Martinique Relief Committee of Porto Rico. The people are more desirous of transportation out of the island than of any other relief which can be offered them.

"The United States steamer Potomac has arrived at St. Lucia. She reports that Fort-de-France, Martinique, was not injured by the last volcanic disturbance, but that the people of the town were panic-stricken.

"All was quiet at Fort-de-France. Thursday, May 22d, passed without incident, and the population are becoming much calmer, especially as the volcano is gradually losing its terrifying aspect. Nevertheless the exodus still continues. Another party from Fort-de-France, numbering nearly 1500 people, left last evening for Trinidad and other places.

"These, with about 1200 who have gone to Guadeloupe, and many others who have sought refuge at St. Lucia and other islands, has considerably lessened the population. Moreover, 2000 have gone to the southern part of Martinique, where 3000 refugees have now assembled. Most of the shops are closed because of the flight of employes, and also because of the large quantities of supplies of all kinds which have now reached this port for free distribution.

"Gendarmes who returned from St. Pierre last evening brought several books and valuables which they found in the open safes there. These and the other safes had been burst open

by irresistible force. All the articles recovered are being cared for by the Government. Two more bodies were found at St. Pierre yesterday. One was fairly well dressed, but both appeared to be the remains of household servants, who had died from asphyxiation.

"From the heaps of cinders in the Rue de Luci dangerous emanations of foul gas have been discovered, and the attention of the health authorities has been directed to the spot. A new crater has formed in the vicinity of Ajoupa Bouillon. A locality known as Camas Trianon is causing a good deal of anxiety at present. The Capote River is running with hot water.

"The French cruiser D'Assas has arrived from Brest bearing the French Government Relief Commission and large supplies of money and provisions. The United States steamers Potomac and Dixie and the United States cruiser Cincinnati have sailed for St. Vincent, and there are no American warships here. They will all probably return to Fort-de-France in two or three days. The Dixie landed 600 tons of supplies here.

NEW CRATER BELOW THE OLD.

"Scientists who came on the steamer Dixie from New York again visited St. Pierre yesterday, preliminary to departure for St. Vincent. The top of the mountain was clearly visible for a considerable time. Captain Thomas C. McLean, of the cruiser Cincinnati, who has carefully observed Mont Pelée, agrees with others in reporting that a new crater has been formed below the old crater. In the new crater there is a great cinder cone, more than a hundred feet high, from which steam and other volcanic matter are constantly pouring.

"It is now the unanimous opinion of the scientists that this is an explosive volcano, no real lava or moya rock material having been poured out, only mud, steam, gases and fragments of the old crater beds. The scientists compare the mountain's outthrow to the steam of a boiler in which the pressure rises to bursting point, and they think it possible that a more violent outbreak may occur. The scientists remark that the explosions have occurred at pro-

gressively longer intervals, and that they have also been progressively more violent.

"Thus there were three light eruptions of ashes. On May 5th, there was an overflow of mud, which caused the destruction of the Usine Guerin ; on May 8th, there was the outburst which destroyed St. Pierre, and on May 20th, or after an interval of twelve days, the last tremendous outburst took place.

"A new period of rest is now on, and one of two things may happen—the pressure may be confined for a still longer period and then explode with still greater violence, spreading destruction over a vast area,or the mountain may remain quiescent for another half century. These explosions were unique in the character of the material ejected. Choking, poisonous and blazing gases were hurled forth with fearful velocity and force."

CONTINUED ERUPTIONS.

Professor Willard Hayes, in charge of the United States Geological Survey, made this statement :

"Cable despatches from Pointe-a-Pitre which state that a great light was seen May 22d in the direction of Martinique indicate clearly that the eruptions of Mont Pelée continue with considerable violence. But the significance is apt to be greatly overestimated. Pointe-a-Pitre is on the island of Guadeloupe, almost exactly one hundred miles from Mont Pelée, and midway between the two places is the island of Dominica, which contains mountains more than four thousand feet in altitude. The glow must, therefore, be at least eight thousand feet above sea level if its origin is in Pelée.

"The conditions favorable for the production of such a phenomenon are very simple. There is, doubtless, a large mass of incandescent lava now occupying the greatly enlarged crater. This overflows, forming the lava streams, which are described as flowing down the mountain's sides in various directions. The streams quickly lost their heat and a dark crust forms on their surface.

"The lava in the crater, however, remains incandescent

because of its greater mass and because the escaping gases bring fresh supplies of heated matter from great depths. This crater is like a ladle of molten steel, which is kept in violent ebullition by the escape of the occluded gases.

"The crater will remain in this condition as long as the supply of gases is sufficient to enable them to force their way through the lava. As this supply gradually diminishes, the lava in the crater will slowly solidify, the vent decreasing in size, while a new cone is built up by the material thrown out by the recurrent explosion.

"To return to the light observed from Pointe-a-Pitre, the vapor thrown out by the volcano condenses, and with the dust carried up forms a cloud, which hangs over the crater and is illumined by the incandescent lava below. While it is highly probable that inflammable gases, such as hydrogen and chlorine, are given off by all volcanoes in violent eruption and some actual flames may be seen, by far the larger part of the illumination, which characterizes all such eruptions, is due to the reflected glow from incandescent lava. It is precisely what may be observed when the ray from a search light is thrown on a mass of steam or smoke. There is, therefore, nothing unusual or specially disquieting in the report from Pointe-a-Pitre.

"Later reports will doubtless indicate that the same glow has been observed from much greater distances. This report may even be regarded as somewhat reassuring. It indicates that the air is much clearer and freer from dust than for several days following the first eruption. Otherwise the glow from the incandescent lava could not reach clouds eight thousand feet in altitude, but would be cut off by the dense pall, which is described as hanging low over the island

"With regard to the reported sounds, it should be remembered that every ear in the Lesser Antilles is strained toward Martinique, and sounds are eagerly noted, which under ordinary conditions would be wholly ignored, and it does not follow that these reports are louder than those which accompanied the first eruption."

CHAPTER XVI.

North American Volcanoes.—Famous Mount Shasta.—Northern Arizona.—Volcanic Glass.—Craters on the Pacific Coast.

A ZONE of mountains extends along the whole western flank of the American continent, from the northern to the southern extremity. This, from Alaska to Terra del Fuego, is associated with volcanoes, though the vents are only locally active, and in the majority of cases the craters are either ruinous or have disappeared. In the extreme north, a volcanic belt extends from the head of Cook's Inlet on the east through Alaska and over the Aleutian Isles towards the district already described. The higher mountains, however, so far as is at present known, are not volcanic —Mount St. Elias, about 18,000 feet, certainly is not.

The same is probably true of its yet more lofty neighbor, Mount Logan, and the other summits near the frontier of British and United States territory; the Alaska coast also, which forms a fringe to this region, seems to be free from volcanoes, and the same is true of South-eastern Alaska and its islands, with the exception of Mount Edgecumbe, an insular volcano which is reported to be a basaltic crater about 2855 feet high, and to have been active in 1796. Eruptions are said to have occurred from Mount Calder and other summits on Prince of Wales Island at a slightly earlier date; but these, as Professor I. C. Russell informs us, are as yet very imperfectly known.

The most conspicuous and best-marked belt begins at Cook's Inlet on the east, and extends through the Alaskan promontory to the Aleutian Islands. It is about a thousand miles long, but generally less than forty miles broad. In fact, every volcano in it which is known to have been active in historic times can be included between two lines on the map of Alaska, twenty-five miles apart. Craters in good preservation are numerous, and active vents not few, one of which has been alreadynoticed. They occur

either close to the sea on the southern border of the mainland or on islands.

To this statement as to the geographical distribution one exception is known; some small cones, also of basalt, occur near St. Michael on the coast of Behring Sea, about seventy miles north of the mouth of the Yukon River; but there may be others, for at present not much of Alaska has been carefully investigated by qualified observers. On Copper River, some two hundred miles to the northeast of Cook's Inlet, and thus apparently insulated from the Aleutian belt, rises Mount Wrangel, a lofty volcano, which was in eruption in 1819 and is still steaming, and others of the neighboring mountains may have the same origin.

On the western shore also of this inlet are two fine volcanic peaks, Redoute and Iliamna, reported to be about 11,000 and 12,000 feet high. The latter is generally steaming, and a few years ago discharged such a quantity of dust and lapilli that the forests were killed over hundreds of square miles on the adjacent lowlands.

VOLCANOES OF ALASKA.

From this district to Central America no active vents exist, though they were once plentiful. In the Canadian territory to the south and east of United States Alaska very little is at present known of its volcanic history. There are lava sheets about the Fraser River of enormous extent, but Dr. G. M. Dawson did not discover here any distinct traces of craters, so that very probably this portion of the American continent may be compared with the northern side of the Atlantic basin, where discharges anciently occurred from Antrim at least as far as Iceland, but now continue only in the latter region.

The Columbia lavas, vast sheets of basalt, have been already mentioned; but here, as in the Fraser River district, cinder cones and craters are wanting, and the eruptions probably date from about the middle of the Tertiary era. They lie to the east of the Cascade Mountains, in which volcanoes have certainly existed, but whether any retain their craters does not seem to be as yet ascertained. There is a tradition that Mount Baker, a fine peak to the west of

the main chain and in the northern part of the district (near Puget Sound), broke out in 1843, but on this point Professor Russell is doubtful.

Mount Rainier, however, a superb peak, not only from its elevation, 14,525 feet, but also because it rises practically from sea-level, still emits some steam. The highest part is a cone built up within the shattered ring of a much older crater, and the materials appear to be basaltic. Mount St. Helens (9,750 feet), also detached from the main mass, is said to have been in eruption in 1841-42, and fumaroles still exist on the slopes. Mount Adams (9,570 feet), farther south and rather east of the main range, apparently retains a crater.

On the crest of the Cascade Mountains, in Northwestern Oregon, Mount Hood rises to a height of 11,225 feet, and is noted for the beauty of its outline. Portions only of the wall of its summit crater now remain, but there are still fumaroles at considerable elevations on the northeast and the south sides. Mount Jefferson (10,200 feet) and the Three Sisters, a little farther south, in the Cascade range, are the sites of ancient volcanoes; but their craters apparently have perished, and to the south of these come others of less elevation, which for the most part retain craters either at their summits or on their flanks, the most important of them being Crater Lake or Mount Mazama, which has been already described.

SUMMIT CRATER OF SHASTA.

Yet farther south comes the noted mass of Mount Shasta, rising to a height of 14,350 feet. The summit crater is ruinous, and the slopes are scarred with ravines; but lava streams have flowed down its flank since the Glacial epoch, and a distinct subsidiary crater remains on a lower summit called Shastina. Farther south comes a volcanic district named Lassen's Peak from its principal summit, which rises to an elevation of 10,437 feet. This is crossed from northwest to southeast by a belt of volcanic cones about fifty miles long by twenty-five miles wide; one of them, Cinder Cone by name, being remarkably well preserved.

The crater, as illustrated by Professor Russell, is a double one, and there were two distinct periods of eruption. In the earlier a quantity of ash was ejected and the cinder cone itself was formed. Then there was a pause long enough to allow ten feet of diatomaceous earth to accumulate on the bed of an adjacent lake, and after that came the quiet effusion of a large sheet of lava.

East of the Sierra Nevada, on the area once occupied by a great sheet of water now spoken of as Lake Lahontan, are two ancient craters filled with alkaline water. The greater, which has an area of about 268 acres, only rises some eighty feet above the level of the surrounding country, so that it resembles, though on a larger scale, such a crater as the Pulvermaar in the Eifel. Geological evidence shows that these were active during the existence of Lake Lahontan, and that before they ceased it had already begun to dry up.

POURING OUT LAVA STREAMS.

In the Mono valley, also east of the Sierra Nevada, but farther south, and near to the lake of the same name, are a number of craters, some not much elevated above the surrounding country, but others rising to over 2000 feet, with lava streams and fumaroles. The materials apparently consist of basalts and varieties of andesite; but the Mono craters, as the line of higher cones is called, have ejected rhyolite and even obsidian. Professor Russell remarks that those cones (some of which have lost their craters), though forming an isolated group, are really a portion of a much more extended series of recent eruptions, which follow the general course of the great belt of branching faults by which the eastern face of the Sierra Nevada has been determined.

The fact that, as a rule, the central cones are the less perfectly preserved and are the older, shows that "the volcanic energy early in the history of the range evidently found an avenue of escape where [they] now stand, and when the conduits of these craters became clogged newer craters were formed, both to the north and south, along the same line or belt of fracture."

To the west of the Wahsatch Mountains, in the inland basin of Utah, and on the area once occupied by the great sheet of water designated Lake Bonneville, are the Ice Spring Craters, a group of low craters, three of which are very well defined, though they are breached by streams of basaltic lava, which covers an area of over twelve square miles. Other craters occur in the district, some being older and some newer than Lake Bonneville, while others were active during its existence.

In northern Arizona the San Francisco Mountains are volcanic. The higher summits, which rise to a mean elevation of 12,562 feet above the sea and about 5700 above the general level of the surrounding table-land, consists largely of trachytic lavas and have lost their craters; but around them are numerous small craters of basaltic scoria, which often are well preserved and are associated with flows of the same rock. Some of these have been breached by the lava, which has welled up in their interior and has escaped exactly as was described by Scrope in his book on The Volcanoes of Central France. In one, however, a lake is sheltered.

FAR-FAMED YELLOWSTONE PARK.

Just east of the crest of the Rocky Mountains, and in the northwest corner of the State of Wyoming, is the far-famed volcanic district of the Yellowstone Park and its neighborhood. Craters apparently are not common in this region, but the great flows of obsidian attracted much attention from geologists. This volcanic glass is associated with pumice, the rocks generally being trachytes, usually rich in silica. The vents are now extinct, unless a mud volcano be regarded as an exception; but the hot springs and geysers to which the Park owes its world-wide fame show that a high temperature still prevails, probably at no great depth below the surface.

The vast flows of basalt in the valleys draining to the Snake River in Idaho, to which reference has already been made, are on the western slope of the Rocky Mountains, but at no very great distance from the Yellowstone Park. Also east of the Rocky Mountains, in the State of Colorado, are several

very large cones and flows of basalt, while to the south of Pucho the bold summits of the Spanish Peaks, which rise respectively to heights of 12,720 and 13,620 feet above the sea, are ancient volcanoes ; but in all these the craters seem to have been destroyed. The materials are described as trachytes, some varieiies approaching rhyolite.

Farther south, however, in the State of New Mexico, are several extinct volcanoes, some of which retain their craters in good preservation. The materials, so far as described, are basalt. Mount Taylor (11,390 feet) also is the centre of a volcanic district. Its crater has perished, but these remain on some of the smaller neighboring cones. The rock apparently is basalt.

The long peninsula of Lower California may be regarded as a prolongation of the chain of the Sierra Nevada. It also contains many extinct volcanoes, which, however, are at present but imperfectly known. Towards the north, according to Professor Russell, Mount Santa Catalina rises to a height of some 10,000 feet, and about the middle is a group of volcanic peaks known as the Tres Virgines, the highest of which is said to be 7250 feet. In this group an eruption occurred in 1857, and since then steam has been ejected, sometimes in great quantity.

THREE MOUNTAIN CHAINS.

Those described above, as Professor Russell remarks, are only some of the most striking instances among the hundreds of lava-flows and craters within the United States ; but it will be noticed that the great majority are associated with the second one of the three mountain chains which form the western flank of the North American continent, the huge eastern mass of the Rocky Mountains being almost entirely, and the smaller western one of the Coast Range being wholly, free from volcanoes of recent date. The Sierra Madre in Mexico, which may be regarded as a prolongation of the Rocky Mountains, appears to exhibit no signs of volcanic action.

Thus a very considerable space separates the volcanoes of the part of Mexico which lies south of the tropic of Cancer, a region

of great activity even in the present day, from those of which we have been speaking. The former also appear not to lie, as usual, along a belt parallel with the western coast, but to be rather irregularly distributed over one, about 150 miles in breadth, which extends from sea to sea in a general direction from W. N. W. to E. N. E. for not much less than 600 miles.

All the volanoes in Mexico which are still active (ten in number according to Reclus) lie south of latitude 22°. The most northerly of them is Ceboruco (about 7140 feet) on the Pacific coast, the centre of a group of craters, which was in eruption in 1870, and has continued steaming ever since. Farther south, near the same coast, is Colima, which has frequently been active. In 1885, the dust from it was carried to the northeast for a distance of 280 miles.

A CELEBRATED VOLCANO.

Proceeding eastwards, and slightly to the south, we come to Jorullo, the eruption of which, ever since the days of Humboldt, has figured so largely in geological text books. This for many years was quoted as an example which very strongly supported the elevation theory of volcanic cones. It was asserted that here a tract of land from three to four miles in extent had almost suddenly swelled up like a bladder, while cones were built by discharges from its surface and at its sides. This happened on the night of September 29, 1759; but, as has been frequently shown, the evidence for this remarkable phenomenon is quite untrustworthy.

Proceeding east, the volcanoes became more lofty. Xinantecatl, some forty miles southwest of the city of Mexico, crowned by two crater-lakes, rises to about 15,000 feet; but east of that city are two giants, Ixtacihuatl to the north, and Popocatepetl to the south. The former, which, however, has lost its crater, is hardly less, perhaps more, than 16,500 feet; but Popocatepetl is about 1200 feet more than this, and terminates in a crater from which a little steam issues. The lower part of the mountain consists of basalt, but the great cone is mostly composed of andesite and its summit is described as trachyte.

Yet farther to the east come Cofre de Perote and Orizaba, which also lie on a north and south line; the former, which is composed of hornblende andesite, has lost its crater and is only 13,552 feet high; but its companion is the highest volcanic summit on the northern continent. The exact measurement is uncertain, but it cannot be much, if at all, less than 18,000 feet. On the summit are three craters in good preservation, and the flanks of the mountain are studded with small cones. Its last eruption is said to have occurred in the eighteenth century.

Finally, on the eastern coast is Tuxtla, reported to be a little less than 5000 feet high, which is active from time to time. A terrible eruption occurred, after a pause of nearly one hundred and twenty years, in March, 1793. A series of violent explosions considerably reduced the height of the mountain and scattered ashes over a large area. The fine dust was borne by the wind about 150 miles to the northwest, and the same distance to the southwest. This fact suggests that, as happened to a less extent in an eruption of Cotopaxi, part of the dust was shot up into a region where an upper stratum of air was moving in a different direction from the lower one.

EXPLOSION AFTER LONG REPOSE.

Still in Mexico, but considerably to the south of the belt described above, and on the shore of the Pacific, is Chacahua, an extinct crater, while to the east of it is Pochutla, a volcano which, after a very long period of repose, exploded in 1870.

From Guatemala to Costa Rica is a zone marked by great volcanic activity, which follows the line of the Pacific coast. Some of the cones on this rise to elevations considerably above 10,000 feet, but the majority do not exceed 8000 In Guatemala, according to a list given by Professor Russell, there are two active volcanoes, four quiescent, and fifteen extinct. Among the last-named is Tajamulco, which lays claim, though probably without warrant, to an altitude of 18,317 feet.

In San Salvador five are active, three quiescent, and the same number extinct. Honduras, which lies chiefly to the east of

the mountain axis, is without an active volcano, but has two quiescent and three extinct. Nicaragua contains four active, eight quiescent, five extinct, while in Costa Rica one only can be called active, and its last eruption was as long ago as 1726, while two are quiescent and six extinct. Lastly, at the northern part of the Isthmus of Panama are three mountains of volcanic origin, two of them over 11,000 feet high, but it is doubtful whether any one retains a remnant of a crater.

Three of the volcanoes in the above-named list are especially interesting, because, like Monte Nuovo, the history of their actual birth is recorded. Two of these are in San Salvador, the third in Nicaragua. Of the former, Izalco, now rising about 3000 feet above the surrounding country and 5000 feet above the sea-level, began to be formed in the year 1770. It covers what previously was a fine cattle farm. "The occupants on this estate were alarmed by subterranean noises and shocks of earthquakes about the end of 1769, which continued to increase in loudness and strength until the twenty-third of the February following, when the earth opened about half a mile from the dwellings on the estate, sending out lava, accompanied by fire and smoke."

HOW THE CONE WAS BUILT UP.

The eruption thus begun went on continuously, lava sometimes being ejected, but at others only ashes and volcanic bombs, and thus the cone has been built up to its present height. No lava has been discharged for many years, but ashes and dust, mingled with steam, are constantly ejected. There are three craters, the central one being the largest and most active. Acid vapors also are emitted from fumaroles. Lake Ilopango, which possibly occupies an ancient crater, also in San Salvador, witnessed the beginning of a volcano as lately as the year 1880.

A violent earthquake in 1879 was accompanied by a rising of steam from the lake, and was followed by a steady fall in the level of its waters, amounting to about thirty-five feet. Then, during the night of January 20, 1880, the surface of the lake was again agitated, and the next morning a pile of rocks was observed in

the centre, from which rose a column of vapor. The eruption lasted for more than a month, sulphurous vapors were emitted copiously, the fish in the lake were killed, and a cone was ultimately formed about 160 feet above the water, but rising from a depth of some 600 feet.

A new volcano broke out on April 11, 1850, in Nicaragua, in a district called the Plain of Leon. This is studded with cones, of which one at least is active. The commencement of the eruption was not carefully observed, but the outbreak occurred near the base of an extinct crater called Las Pilas. It began with a copious discharge of lava.

This ceased on the fourteenth of the month, and was succeeded by a different phase of action, namely, a series of paroxysms lasting about three minutes, with intervals of about the same length. By these, steam, ashes, and red-hot bombs were shot up to a height of several hundred feet, accompanied, it is said, by outbursts of flame. Thus in the course of a week a cone was built up to a height of from a hundred and fifty to two hundred feet, after which the action became much more intermittent.

THREE SOUTH AMERICAN PEAKS.

Among the older summits of Central America it may suffice to mention three, all of which are lofty mountains. Volcan de Agua, 12,213 feet, at the time of the Spanish invasion was a crater-lake. In the year 1541, after an earthquake, the wall of the crater gave way on the northeastern side and the water escaped, doing great damage as it rushed down the slope of the mountain. Fuego, to the east, with its group of three volcanic cones, the highest of which attains to 13,943 feet, was often active in the sixteenth and seventeenth centuries, and probably for some long time previously; but since then eruptions have been less frequent, though one occurred as late as 1860, and steam still issues from the crater.

But the most noted of all is Coseguina, for it was the scene of a frightful eruption in the year 1835. So far as is known, this, like the famous awakening of Vesuvius in the year 79, put an

end to a long period of complete repose. It began on the morning of January 20th, when several loud detonations were heard, followed by the ejection of a cloud of inky smoke, through which "darted tongues of flame resembling lightning." The cloud spread gradually outward, obscuring the sun, while fine dust fell from it like rain. This went on for two days, the sand falling more and more thickly and the explosions becoming louder and louder.

On the third day they reached a maximum and the darkness became intense. The quantity of material that fell was so great that for leagues around people actually deserted their houses, fearing lest their roofs might be crushed in. At Leon, more than a hundred miles away, the dust lay several inches deep, and it was carried to Jamaica, Vera Cruz and Santa Fé de Bogota, over an area of 1500 miles in diameter. The sea also was covered with floating masses of pumice for a distance of some fifty leagues.

FOUR MILES IN DIAMETER.

During the eruption the height of the cone was considerably reduced, but to what extent is not certainly known; probably by at least one half, for it is now a crater four miles in diameter and only 3600 feet above the sea. Many of the phenomena during this outbreak closely agree with those associated with the first eruption of Vesuvius and that of Krakatoa already described.

The Isthmus of Panama, though its hills in places are comparatively low and without volcanic cones, links together the great mountain chains of North and South America. But that of the Andes, which extends along the whole western flank of the latter, is rather less complicated in structure than the system of the former country. It is a single chain, consisting partly of sedimentary, partly of igneous rocks, old and new, both crystalline and volcanic. The sedimentaries and the older igneous form the lower part of the great mountain wall, and the volcanoes, generally speaking, rise more nearly from its crest than from its flanks.

They are not, however, continuous along the whole chain, but

form three principal groups—those of Colombia and Ecuador in the north, those of Bolivia in the centre, and those of Chili in the south. About sixty craters are still active; those which are extinct and more or less ruined may be counted by hundreds. The first group, in the more northern part, consists of three principal ranges, of which the eastern one branches out at last into the great mountains which runs roughly parallel with the border of the Caribbean Sea.

The western range is less elevated than the others, at any rate in its more northern part; the central, on which the volcanoes are chiefly situated, supports many lofty peaks. Of these Mesa de Herveo, 18,340 feet, retains its ancient crater; Ruiz, 17,189 feet; Tolima, 18,392 feet; and Huila, 18,701, all show some signs of life. An eruption occurred at Puracé, 15,425 feet, in 1849, when the torrents of mud caused by the rapid melting of the snow caused much devastation. Extinct volcanoes are also frequent. In the eastern chain no vents are mentioned as active.

FIERY SUMMITS OF ECUADOR.

Passing into Ecuador, the volcanic summits, according to Mr. Whymper, are grouped along two roughly parallel lines. On the western, Cotocachi, Pichincha, Corazon, Illiniza, Carihuairazo, and Chimborazo are the most important; on the eastern, Cayambe, Antisana, Sincholagua, Cotopaxi, Altar, and Sangai. Of these the majority have lost their craters, including Chimborazo. Altar retains one, so does Pichincha, which apparently is hardly extinct, while Sangai and Cotopaxi, which has been already described, are still active.

It may suffice to say that the specimens brought back by Mr. Whymper were almost without exception varieties of andesite, several of them containing hypersthene. Antisana, however, also furnished a pitchstone. The volcanic cones, according to Reiss and Wolf, continue for some distance to the south of those which have been mentioned.

In the Peruvian and Bolivian Andes we find the second linear group of craters. The same arrangement in parallel lines

to continue, and the highest summit, Hauscan, is said to overtop Chimborazo by rather more than 1300 feet. Volcanic cones are most frequent in the southern part of the western range, where they set in again some 1200 miles from those of Ecuador. Few, however, are mentioned as active in historic times; among them Ubinas, Omate, Candarave (18,964 feet), are enumerated by Reclus. But among the extinct volcanoes some also rise to great heights, such as Sara-Sara, Achatayhua, Coro Puna, Ampato, Misti, and Chachani, all of which exceed 13,000 feet, the last reaching 19,767 feet and Misti 18,504 feet.

This volcanic group continues into Bolivia, and there are some active craters, especially near Lake Titicaca. Presumably the higher peaks of this country, five of which are enumerated as over 21,000 feet, and the highest, Illimani, reaching 22,350 feet, are volcanic, and the last is said to smoke constantly. Altogether, sixteen craters are asserted to be active in this second group of Andres volcanoes, of which, at present, our knowledge is rather imperfect.

LONG CEASED TO BE ACTIVE

Passing on to the third group, the volcanoes of Chili, we find these numerous, though, for the most part, they have long ceased to be active. In the northern part, however, two at least, Llullaillaco (17,061 feet) and Dona Inez are still at work. In the middle are the highest summits—Aconagua, 22,867 feet; Cerro del Mercedario, 22,302 feet; Tupungato, 10,269 feet; San José, 20,000 feet; and Maipo, 17,657 feet. Of these, Aconagua has entirely lost its crater, and Tupungato retains due distinctive trace of it, but one or two vents are still active; one about 13,000 feet high, lying some twenty miles to the southwest of Tupungato. In this part also, according to Mr. FitzGerald, the Andes consist of two ranges, of which the western is the watershed; the other supports the highest peaks. There is also a third and eastern range, but this is separated from the main chain by a valley only about 4000 feet above sea level.

The rocks brought back by Messrs. FitzGerald and Vines are mostly andesites, the actual summits of Aconagua and Tupun-

gato being the hornblende-bearing variety of that rock, though a rhyolite or dacite was obtained on the flank of the latter mountain. The volcanic line does not completely come to an end with Chili, for Corcovado (7510 feet) in the Patagonian Andes is a volcano, but though there may be some extinct cones yet farther south, the active vents are not continued to Cape Horn.

CHAPTER XVII.

RIDGE OF PANAMA AND THE ANDES.—THE GREAT CANYON.—CALIFORNIA AND UTAH.—YELLOWSTONE PARK.—MEXICO AND SOUTH AMERICA.

IN no point is there a more remarkable contrast between the physical structure of Eastern and Western America than in the absence of volcanic phenomena in the former and their prodigious development in the latter. The great valley of the Mississippi and its tributaries forms the dividing territory between the volcanic and non-volcanic areas; so that on crossing the high ridges in which the western tributaries of America's greatest river have their sources, and to which the name of the "Rocky Mountains" more properly belongs, we find ourselves in a region which, throughout the later Tertiary times down almost to the present day, has been the scene of volcanic operations on the grandest scale; where lava-floods have been poured over the country through thousands of square miles, and where volcanic cones, vying in magnitude with those of Etna, Vesuvius, or Hecla, have established themselves.

This region, generally known as "The Great Basin," is bounded on the west by the "Pacific Range" of mountains, and includes portions of New Mexico, Arizona, California, Nevada, Utah, Colorado, Idaho, Oregon, Wyoming, Montana and Washington. To the south it passes into the mountainous region of Mexico, also highly volcanic; and thence into the ridge of Panama and the Andes. It cannot be questioned but that the volcanic nature of the Great Basin is due to the same causes which have originated the volcanic outbursts of the Andes; but, from whatever cause, the volcanic forces have here entered upon their secondary or moribund stage.

In the Yellowstone Valley, geysers, hot springs and fumaroles give evidence of this condition. In other districts the lava streams are so fresh and unweathered as to suggest that they had been

erupted only a few hundred years ago ; but no active vent or crater is to be found over the whole of this wide region. A few special districts only can here be selected by way of illustration of its special features in connection with its volcanic history.

This tract, which is drained by the Colorado river and its tributaries, is bounded on the north by the Wahsatch range, and extends eastward to the base of the Sierra Nevada. Round its margin extensive volcanic tracts are to be found, with numerous peaks and truncated cones—the ancient craters of eruption—of which Mount San Francisco is the culminating eminence.

South of the Wahsatch, and occupying the high plateaux of Utah, enormous masses of volcanic products have been spread over an area of 9000 square miles, attaining a thickness of between 3000 and 4000 feet. The earlier of these great lava-floods appear to have been trachytic, but the later basaltic ; and in the opinion of Captain Dutton, who has described them, they range in point of time from the Middle Tertiary (Miocene) down to comparatively recent times.

HIGH LEVELS IN UTAH.

To the south of the high plateaux of Utah are many minor volcanic mountains, now extinct ; and as we descend towards the Grand Canon of Colorado we find numerous cinder cones scattered about at intervals near the cliffs. Extensive lava fields, surmounted by cinder cones, occupy the plateau on the western side of the Grand Canon ; and, according to Dutton, the great sheets of basaltic lava, of very recent age, which occupy many hundred square miles of desert, have had their sources in these cones of eruption.

Crossing to the east of the Grand Canon, we find other lava floods poured over the country at intervals, surmounted by San Francisco—a volcanic mountain of the first magnitude—which reaches an elevation, according to Wheeler, of 12,562 feet above the ocean. It has long been extinct, and its summit and flanks are covered with snow fields and glaciers. Other parts of Arizona are overspread by sheets of basaltic lava, through which old

"necks" of eruption, formed of more solid lava than the sheets, rise occasionally above the surface, and are prominent features in the landscape.

Further to the eastward in New Mexico, and near the margin of the volcanic region, is another volcanic mountain little less lofty than San Francisco, called Mount Taylor, which, according to Dutton, rises to an elevation of 11,390 feet above the ocean, and 8200 feet above the general level of the surrounding plateau of lava. This mountain forms the culminating point of a wide volcanic tract, over which are distributed numberless vents of eruption. Scores of such vents—generally cinder cones—are visible in every part of the plateau, and always in a more or less dilapidated condition. Mount Taylor is a volcano, with a central pipe terminating in a large crater, the wall of which was broken down on the east side in the later stage of its history.

VOLCANIC RANGES.

Proceeding westward into California, we are again confronted with volcanic phenomena on a stupendous scale. The coast range of mountains, which branches off from the Sierra Nevada at Mount Pinos, on the south, is terminated near the northern extremity of the State by a very lofty mountain of volcanic origin, called Mount Shasta, which attains an elevation of 14,511 feet. This mountain was first ascended by Clarence King in 1870, and although forming, as it were, a portion of the Pacific Coast Range, it really rises from the plain in solitary grandeur, its summit covered by snow, and originating several fine glaciers.

The summit of Mount Shasta is a nearly perfect cone, but from its northwest side there juts out a large crater-cone just below the snow line, between which and the main mass of the mountain their exists a deep depression filled with glacier ice. This secondary crater-cone has been named Mount Shastina, and round its inner side the stream of glacier ice winds itself, sometimes surmounting the rim of the crater, and shooting down masses of ice into the great cauldron.

The length of this glacier is about three miles, and its breadth

about 4000 feet. Another very lofty volcanic mountain is Mount Rainier, in the Washington territory, consisting of three peaks of which the eastern possesses a crater very perfect throughout its entire circumference. This mountain appears to be formed mainly of trachytic matter. Proceeding further north into British territory, several volcanic mountains near the Pacific coast are said to exhibit evidence of activity.

Of these may be mentioned Mount Edgecombe, Mount Fairweather, which rises to a height of 14,932 feet; and Mount St. Elias, just within the divisional line between British and Russian territory, and reaching an altitude of 16,860 feet. This, the loftiest of all of the volcanoes of the North American continent, except those of Mexico, may be considered as the connecting link in the volcanic chain between the continent and the Aleutian Islands.

LAKES AND THEIR ORIGIN.

Returning to Utah we are brought into contact with phenomena of special interest, owing to the inter-relations of volcanic and lacrustine conditions which once prevailed over large tracts of that territory. The present Great Salt Lake, and the smaller neighboring lakes, those called Utah and Sevier, are but remnants of an originally far greater expanse of inland water, the boundaries of which have been traced out by Mr. C. K. Gilbert, and described under the name of Lake Bonneville.

The waters of this lake appear to have reached their highest level at the maximum cold of the Post Pliocene period, when the glaciers descended to its margin, and large streams of glacier water were poured into it. Eruptions of basaltic lava from successive craters appear to have gone on before, during, and after the lacustrine epoch; and the drying up of the waters over the greater extent of their original area, now converted into the Sevier Desert, and their concentration into their present comparatively narrow basins, appears to have proceeded pari passu with the gradual extinction of the volcanic outbursts.

Two successive epochs of eruption of basalt appears to have been clearly established—an earlier one of the "Provo Age,"

when the lava was extruded from the Tabernacle craters, and a later epoch, when the eruptions took place from the Ice Spring craters. The oldest volcanic rock appears to be rhyolite, which peers up in two small hills almost smothered beneath the lake deposits. Its eruption was long anterior to the lake period.

On the other hand, the cessation of the eruptions of the later basaltic sheets is evidently an event of such recent date that Mr. Gilbert is led to look forward to their resumption at some future, but not distant, epoch. As he truly observes, we are not to infer that, because the outward manifestations of volcanic action have ceased, the internal causes of those manifestations have passed away. These are still in operation, and must make themselves felt when the internal forces have recovered their exhausted energies ; but perhaps not to the same extent as before.

COUNTRY BORDERING SNAKE RIVER.

The tract of country bordering the Snake River in Idaho and Washington is remarkable for the vast sheets of plateau-basalt with which it is overspread, extending sometimes in one great flood farther than the eye can reach, and what is still more remarkable, they are often unaccompanied by any visible craters or vents of eruption. In Oregon the plateau-basalt is at least 2000 feet in thickness, and where traversed by the Columbia River it reaches a thickness of about 3000 feet.

The Snake and Columbia rivers are lined by walls of volcanic rock, basaltic above, trachytic below, for a distance of, in the former, one hundred, in the latter, two hundred, miles. Captain Dutton, in describing the High Plateau of Utah, observes that the lavas appear to have welled up in mighty floods without any of that explosive violence generally characteristic of volcanic action. This extravasated matter has spread over wide fields, deluging the surrounding country like a tide in a bay, and overflowing all inequalities. Here also we have evidence of older volcanic cones buried beneath seas of lava subsequently extruded.

The absence or rarity, of volcanic craters or cones of eruption in the neighborhood of these great sheets has led American geolo-

gists to the conclusion that the lavas were in many cases extruded from fissures in the earth's crust rather than from ordinary craters. This view is also urged by Sir A. Geikie, who visited the Utah region of the Snake River in 1880, and has vividly described the impression produced by the sight of these vast fields of basaltic lava.

He says, "We found that the older trachytic lavas of the hills had been deeply trenched by the lateral valleys and that all these valleys had a floor of black basalt that had been poured out as the last of the molten material from the now extinct volcanoes. There were no visible cones or vents from which these floods of basalt could have proceeded. We rode for hours by the margin of a vast plain of basalt stretching southward and westward as far as the eye could reach. I realized the truth of an assertion made first by Richthofen, that our modern volcanoes, such as Vesuvius and Ætna, present us with by no means the grandest type of volcanic action, but rather belong to a time of failing activity. There have been periods of tremendous volcanic energy, when instead of escaping from a local vent, like a Vesuvian cone, the lava has found its way to the surface by innumerable fissures opened for it in the solid crust of the globe over thousands of square miles."

HISTORY OF THE ERUPTIONS.

The general succession of volcanic events throughout the region of Western America appears to have been somewhat as follows :

The earliest volcanic eruptions occurred in the later Eocene epoch and were continued into the succeeding Miocene stage. These consisted of rocks moderately rich in silica, and are grouped under the heads of propylite and andesite. To these succeeded during the Pliocene epoch still more highly silicated rocks of trachytic type, consisting of sanidine and oligoclase trachytes.

Then came eruptions of rhyolite during the later Pliocene and Pleistocene epoch ; and lastly, after a period of cessation, during which the rocks just described were greatly eroded, came

the great eruptions of basaltic lava, deluging the plains, winding round the cones or plateaux of the older lavas, descending into the river valleys and flooding the lake beds, issuing from both vents and fissures, and continuing intermittently down almost into the present day—certainly into the period of man's appearance on the scene.

Thus the volcanic history of Western America corresponds remarkably to that of the European regions with which we have previously dealt, both as regards the succession of the various lavas and the epochs of their eruption.

The geysers and hot springs of the Yellowstone Park, like those in Iceland and New Zealand, are special manifestations of volcanic action, generally in its secondary or moribund stage. The geysers of the Yellowstone occur on a grand scale; the eruptions are frequent, and the water is projected into the air to a height of over 200 feet. Most of these are intermittent, like the remarkable one known as Old Faithful, the Castle Geyser, and the Giantess Geyser described by Dr. Hayden, which ejects the water to a height of 250 feet.

TINTS OF RED AND YELLOW.

The geyser waters hold large quantities of silica and sulphur in solution, owing to their high temperature under great pressure, and these minerals are precipitated upon the cooling of the waters in the air, and form circular basins, often gorgeously tinted with red and yellow colors.

In the great Pacific Ocean, the Islands may be referred to two classes, distinguished by their elevation into high and low. The latter class appear to be entirely of modern formation, the product of that accumulation of coral reefs which Flinders and others have described in so interesting a manner. The high islands, on the contrary, are chiefly volcanic, though in the Friendly and Marquesa Islands primitive rocks occur, and in the Waohoo porphyry and amygdaloid.

The Mariana or Ladrone Islands constitute a sort of mountain chain, consisting of a line of active volcanoes, especially

towards their north, which is parallel to that of the Philippine group, whereas the islands that lie detached in the middle of the basin, of which these two groups are the boundaries, seem for the most part to be extinguished.

Mr. Ellis, a missionary, has given in a narrative of a Tour Through the Hawaii Islands a most detailed account of the active volcano of Hawaii.

The plain over which their way to the mountain lay was a vast waste of ancient lava, which he thus describes :—"The tract of lava resembled in appearance an inland sea, bounded by distant mountains. Once it had certainly been in a fluid state, but appeared as if it had become suddenly petrified, or turned into a glassy stone, while its agitated billows were rolling to and fro. Not only were the large swells and hollows distinctly marked, but in many places the surface of these billows was covered by a smaller ripple, like that observed on the surface of the sea at the springing up of a breeze, or the passing currents of air, which produce what the sailors call a cats-paw.

EDGE OF A STEEP PRECIPICE.

"About 2 P. M. the crater of Kilauea suddenly burst upon our view. We expected to have seen a mountain with a broad base and rough, indented sides, composed of loose slags, or hardened streams of lava, and whose summit would have presented a rugged wall of scoria, forming the rim of a mighty cauldron. But instead of this, we found ourselves on the edge of a steep precipice, with a vast plain before us fifteen or sixteen miles in circumference, and sunk from two hundred to four hundred feet below its original level. The surface of this plain was uneven, and strewed over with huge stones and volcanic rock, and in the center of it was the great crater, at the distance of a mile and a half from the place where we were standing. We walked on to the north end of the ridge, where, the precipice being less steep, a descent to the plain below seemed practicable. With all our care, we did not reach the bottom without several falls and slight bruises.

"After walking some distance over the sunken plain, which

in several places sounded hollow under our feet, we at length came to the edge of the great crater, where a spectacle sublime, and even appalling, presented itself before us. Immediately before us yawned an immense gulf, in the form of a crescent, about two miles in length, from N. E. to S. W., nearly a mile in width, and apparently eight hundred feet deep. The bottom was covered with lava, and the S. W. and northern parts of it were one vast flood of burning matter, in a state of terrific ebullition, rolling to and fro its 'fiery surge' and flaming billows.

A BURNING LAKE.

"Fifty-one conical islands of varied form and size, containing so many craters, rose either round the edge, or from the surface of the burning lake; twenty-two constantly emitted columns of grey smoke, or pyramids of brilliant flame; and several of these at the same time vomited from their ignited mouths streams of lava, which rolled in blazing torrents down their black indented sides, into the boiling mass below. The existence of these conical craters led us to conclude that the boiling cauldron of lava before us did not form the focus of the volcano; that this mass of melted lava was comparatively shallow; and that the basin in which it was contained was separated by a stratum of solid matter from the great volcanic abyss, which constantly poured out its melted contents through these numerous craters into this upper reservoir.

"The sides of the gulch before us, although composed of different strata of ancient lava, were perpendicular for about four hundred feet, and rose from a wide horizontal ledge of solid black lava of irregular breadth, but extending completely round, beneath this ledge, the sides sloped gradually towards the burning lake. which was, as nearly as we could judge, three hundred or four hundred feet lower. It was evident that the large crater had been recently filled with liquid lava up to this black ledge, and had, by some subterraneous canal, emptied itself into the sea or under the low land on the shore.

"The grey, and in some places apparently calcined sides of the great crater before us—the fissures which intersected the sur-

face of the plain on which we were standing—the long banks of sulphur on the opposite side of the abyss—the vigorous action of the numerous small craters on its borders—the dense columns of vapor and smoke that rose at the N. and S. end of the plain—together with the ridge of steep rocks by which it was surrounded, rising probably in some places three or four hundred feet in a perpendicular height, presented an immense volcanic panorama, the effect of which was greatly augmented by the constant roaring of the vast furnaces below.

"The natives still persist in believing, that the conical craters of the mountains are the houses of their gods, where they frequently amuse themselves by playing at Konané (a game like draughts); that the roaring of the furnaces and the crackling of the flames are the music of their dance, and that the red flaming surge is the surf in which they play, sportively swimming on the rolling wave. Some of their legends may remind us of those that prevailed among the Greeks.

CURIOUS OLD LEGEND.

"Thus one of their kings, who had offended Pélé, the principal goddess of the volcano, is pursued by her to the shore, where leaping into a canoe he paddles out to sea. Pélé, perceiving his escape, hurls after him huge stones and fragments of rock, which fall thickly around, but do not strike the canoe. A number of rocks in the sea are shown by the natives, which like the Cyclopean Islands at the foot of Mount Etna, are said to have been those thrown by Pélé to sink the boat.

"This legend is very characteristic of the manners and feelings of savage life. The king is represented as taking little pains to secure the escape of anyone but himself, for his mother, wife and children are all abandoned without compunction; his conduct to the friend who accompanies him is the only trait which redeems his character from the charge of utter selfishness, nor among the natives who tell the story, is their praise of the adroitness with which he effected his escape, at all less commended on account of this desertion of his nearest relations."

The globe is girdled by a chain of volcanic mountains in a state of greater or less activity, which may, perhaps, be considered a girdle of safety for the whole world, through which the masses of molten matter in a state of high pressure beneath the crust find a way of escape; and thus the structure of the globe is preserved from even greater convulsions than those which from time to time take place at various points on its surface.

This girdle is partly terrestrial, partly submarine; and commencing at Mount Erebus, near the Antarctic Pole, ranging through South Shetland Isle, Cape Horn, the Andes of South America, the Isthmus of Panama, then through Central America and Mexico, and the Rocky Mountains to Kamtschatka, the Aleutian Islands, the Kuriles, the Japanese, the Philippines, New Guinea, and New Zealand, reaches the Antartic Circle by the Balleny Islands. This girdle sends off branches at several points.

DORMANT VOLCANIC EVENTS.

The linear arrangement of active or dormant volcanic vents has been pointed out by Humboldt, Von Buch, Daubeny and other writers. The great range of burning mountains of the Andes of Chili, Peru, Bolivia, and Mexico, that of the Aleutian Islands of Kamtschatka and the Kurile Islands, extending southwards into the Philippines, and the branching range of the Sunda Islands are well known examples. That of the West Indian Islands, ranging from Grenada through St. Vincent, St. Lucia, Martinique, Dominica, Gaudeloupe, Montserrat, Nevis, and St. Eustace, is also a remarkable example of the linear arragement of volcanic mountains. On tracing these ranges on a map of the world it will be observed that they are either strings of islands, or lie in proximity to the ocean; and hence the view was naturally entertained by some writers that oceanic water, or at any rate that of a large lake or sea, was a necessary agent in the production of volcanic eruptions.

This view seems to receive further corroboration from the fact that the interior portions of the continents and large islands such as Australia are destitute of volcanoes in action, with the

remarkable exceptions of Mounts Kenia and Kilimanjaro in Central Africa, and a few others. It is also very significant in this connection that many of the volcanoes now extinct, or at least dormant, both in Europe and Asia, appear to have been in proximity to sheets of water during the period of activity.

Thus the old volcanoes of the Hauran, east of the Jordan, appear to have been active at the period when the present Jordan valley was filled with water to such an extent as to constitute a lake two hundred miles in length, but which has now shrunk back to within the present limits of the Dead Sea. Again, at the period when the extinct volcanoes of Central France were in active operation, an extensive lake overspread the tract lying to the east of the granitic plateau on which the craters and domes are planted, now constituting the rich and fertile plain of Clermont.

WATER AND EXPLOSIONS.

Such instances are too significant to allow us to doubt that water in some form is very generally connected with volcanic operations; but it does not follow that it was necessary to the original formation of volcanic vents, whether linear or sporadic. If this were so, the extinct volcanoes of the British Isles would still be active, as they are close to the sea-margin, and no volcano would now be active which is not near to some large sheet of water.

But Jorullo, one of the great active volcanoes of Mexico, lies no less than 120 miles from the ocean, and Cotopaxi, in Ecuador, is nearly equally distant. Kilimanjaro, 18,881 feet high, and Kenia, in the equatorial regions of Central Africa, are about 150 miles from the Victoria Nyanza, and a still greater distance from the ocean; and Mount Demavend, in Persia, which rises to an elevation of 18,464 feet near the southern shore of the Caspian Sea, a volcanic mountain of the first magnitude, is now extinct or dormant.

Such facts as these all tend to show that although water may be an accessory of volcanic eruptions, it is not in all cases essential; and we are obliged, therefore, to have recourse to some

other theory of volcanic action differing from that which would attribute it to the access of water to highly heated or molten matter within the crust of the earth.

The view of Leopold von Buch, who considered that the great lines of volcanic mountains above referred to rise along the borders of rents, or fissures, in the earth's crust, is one which is inherently probable, and is in keeping with observation. That the crust of the globe is to a remarkable extent fissured and torn in all directions is a phenomenon familiar to all field geologists. Such rents and fissures are often accompanied by displacement of the strata, owing to which the crust has been vertically elevated on one side or lowered on the other, and such displacements (or "faults") sometimes amount to thousands of feet.

A SYSTEM OF FISSURES.

It is only occasionally, however, that such fractures are accompanied by the extrusion of molten matter; and in the north of England and Scotland dykes of igneous rock, such as basalt, which run across the country for many miles in nearly straight lines, often cut across the faults, and are only rarely coincident with them. Nevertheless, it can scarcely be a question that the grand chain of volcanic mountains which stretches almost continuously along the Andes of South America, and northwards through Mexico, has been piled up along the line of a system of fissures in the fundamental rocks parallel to the coast, though not actually coincident therewith.

The structure and arrangemnt of the Cordilleras of Quito, for example, are eminently suggestive of arrangement along lines of fissure. As shown by Alexander von Humboldt, the volcanic mountains are disposed in two parallel chains, which run side by side for a distance of over 500 miles northwards into the State of Columbia, and enclose between them the high plains of Quito and Lacunga. Along the eastern chain are the great cones of El Altar, rising to an elevation of 16,383 feet above the ocean, and having an enormous crater apparently dormant or extinct, and covered with snow; then Cotopaxi, its sides covered with

snow, and sending forth from its crater several columns of smoke; then Guamani and Cayambe (19,000 feet), huge truncated cones apparently extinct; these constitute the eastern chain of volcanic heights.

The western chain contains even loftier mountains. Here we find the gigantic Chimborazo, an extinct volcano whose summit is white with snow; Carihuairazo and Illiniza, a lofty pointed peak like the Matterhorn; Corazon, a snow-clad dome, reaching a height of 15,871 feet; Atacazo and Pichincha, the latter an extinct volcano reaching an elevation of 15,920 feet; such is the western chain, remarkable for its straightness, the volcanic cones being planted in one grand procession from south to north. This rectilinear arrangement of the western chain, only a little less conspicuous in the eastern, is very suggestive of a line of fracture in the crust beneath.

And when we contemplate the prodigious quantity of matter included within the limits of these colossal domes and their environments, all of which has been extruded from the internal reservoirs, we gain some idea of the manner in which the contracting crust disposes of the matter it can no longer contain.

QUITO AND PERU.

Between the volcanoes of Quito and those of Peru there is an intervening space of fourteen degrees of latitude. This is occupied by the Andes, regarding the structure of which we have not much information except that at this part of its course it is not volcanic. But from Arequipa in Peru, an active volcano, we find a new series of volcanic mountains continued southwards through Tacora (19,740 feet), then further south the more or less active vents of Sajama (22,915 feet), Coquina, Tutupaca, Calama, Atacama, Toconado, and others, forming an almost continuous range with that part of the desert of Atacama pertaining to Chili.

Through this country we find the volcanic range appearing at intervals; and still more to the southwards it is doubtless connected with the volcanoes of Patagonia, north of the Magellan Straits, and of Terra del Fuego. Mr. David Forbes considers

that this great range of volcanic mountains, lying nearly north and south, corresponds to a line of fracture lying somewhat to the east of the range.

A similar statement in all probability applies to the systems of volcanic mountains of the Aleutian Isles, Kamtschatka, the Kuriles, the Philippines, and Sunda Isles. Nor can it be reasonably doubted that the Western American coast line has to a great extent been determined, or marked out, by such lines of displacement; for, as Darwin has shown, the whole western coast of South America, for a distance of between 2000 and 3000 miles south of the Equator, has undergone an upward movement in very recent times—that is, within the period of living marine shells—during which period the volcanoes have been in activity.

GROUPS OF VOLCANOES.

This chain may also be cited in evidence of volcanic action along fissure lines. It connects the volcanoes of Kamtschatka with those of Japan, and the linear arrangement is apparent. In the former peninsula Erman counted no fewer than thirteen active volcanic mountains rising to heights of 12,000 to 15,000 feet above the sea. In the chain of the Kuriles Professor John Milne counted fifty-two well-defined volcanoes, of which nine, perhaps more, are certainly active.

They are not so high as those of Kamtschatka; but, on the other hand, they rise from very deep oceanic waters, and have been probably built up from the sea bottom by successive eruptions of tuff, lava, and ash. According to the view of Professor Milne, the volcanoes of the Kurile chain are fast becoming extinct.

Besides the volcanic vents arranged in lines, of which we have treated above, there are a large number, both active and extinct, which appear to be disposed in groups, or sporadically distributed, over various portions of the earth's surface. I say appear to be, because this sporadic distribution may really be resolvable (at least in some cases) into linear distribution for short distances. Thus the Neapolitan Group, which might at first sight seem to

be arranged around Vesuvius as a centre, really resolves itself into a line of active and extinct vents of eruption, ranging across Italy from the Tyrrhenian Sea to the Adriatic, through Ischia, Procida, Monte Nuovo and the Phlegræan Fields, Vesuvius and Mount Vulture.

Again, the extinct volcanoes of Central France, which appear to form an isolated group, indicate, when viewed in detail, a linear arrangement ranging from north to south. Another region over which extinct craters are distributed lies along the banks of the Rhine, above Bonn and the Moselle; a fourth in Hungary; a fifth in Asia Minor and Northern Palestine; and a sixth in Central Asia around Lake Balkash. These are all continental, and the linear distribution is not apparent.

By far the most extensive regions with sporadically distributed volcanic vents, both active and extinct, are those which are overspread by the waters of the ocean, where the vents emerge in the form of islands. These are to be found in all the great oceans, the Atlantic, the Pacific, and the Indian; but are especially numerous over the central Pacific region.

VOLCANIC CORAL REEFS.

As Kotzebue and subsequently Darwin have pointed out, all the islands of the Pacific are either coral-reefs or of volcanic origin; and many of these rise from great depths; that is to say, from depths of 1000 to 2000 fathoms. It is unnecessary here to attempt to enumerate all these islands which rise in solitary grandeur from the surface of the ocean, and are the scenes of volcanic operations; a few may, however, be enumerated.

In the Atlantic, Iceland first claims notice, owing to the magnitude and number of its active vents and the variety of the accompanying phenomena, especially the geysers. As Lyell has observed, with the exception of Etna and Vesuvius, the most complete chronological records of a series of eruptions in existence are those of Iceland, which come down from the ninth century of our era, and which go to show that since the twelfth century there has never been an interval of more than forty years without either

an eruption or a great earthquake. So intense is the volcanic energy in this island that some of the eruptions of Hecla have lasted six years without cessation.

Earthquakes have often shaken the whole island at once, causing great changes in the interior, such as the sinking down of hills, the rending of mountains, and the desertion by rivers of their channels, and the appearance of new lakes. New islands have often been thrown up near the coast, while others have disappeared. In the intervals between eruptions, innumerable hot springs afford vent to the subterranean heat, and solfataras discharge copious streams of inflammable matter. The volcanoes in different parts of the island are observed, like those of the Phlegræan Fields, to be in activity by turns, one vent serving for a time as a safety-valve for the others.

A HISTORIC ERUPTION.

The most memorable eruption of recent years was that of Skapta Jokul in 1783, when a new island was thrown up, and two torrents of lava issued forth, one forty-five and the other fifty miles in length, and which, according to the estimate of Professor Bischoff, contained matter surpassing in magnitude the bulk of Mont Blanc. One of these streams filled up a large lake, and entering the channel of the Skapta, completely dried up the river. The volcanoes of Iceland may be considered as safety-valves to the region in which lie the British Isles.

This group of volcanic isles rises from deep Atlantic waters north of the Equator, and the vents of eruption are partially active, partially dormant, or extinct. It must be supposed, however, that at a former period volcanic action was vastly more energetic than at present; for except at the Grand Canary, Gomera, Forta Ventura and Lancerote, where various non-volcanic rocks are found, these islands appear to have been built up from their foundations of eruptive materials.

The highest point in the Azores is the Peak of Pico, which rises to a height of 7016 feet above the ocean. But this great elevation is surpassed by that of the Peak of Teneriffe (or Pic de

Teyde) in the Canaries, which attains to an elevation of 12,225 feet, as determined by Professor Piazzi Smyth.

This great volcanic cone, rising from the ocean, its summit shrouded in snow, and often protruding above the clouds, must be an object of uncommon beauty and interest when seen from the deck of a ship. The central cone, formed of trachyte, pumice, obsidian and ashes, rises out of a vast cauldron of older balsaltic rocks with precipitous inner walls—much as the cone of Vesuvius rises from within the partially encircling walls of Somma. From the summit issue forth sulphurous vapors, but no flame.

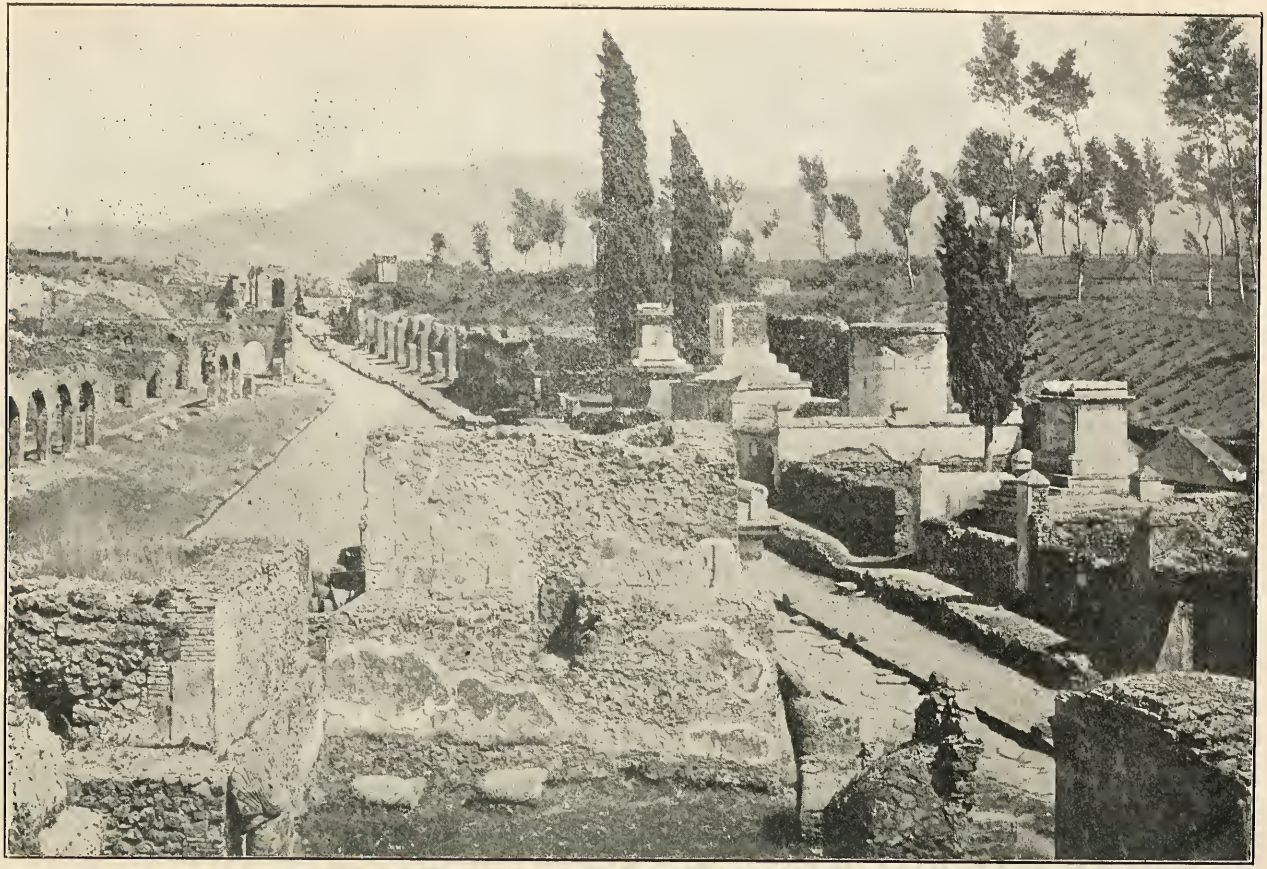
OUTER RING OF BASALT.

Piazzi Smyth, who during a prolonged vist to this mountain in 1856 made a careful survey of its form and structure, shows that the great cone is surrounded by an outer ring of basalt enclosing two foci of eruption, the lavas from which have broken through the ring of the outer crater on the western side, and have poured down the mountain. At the top of the peak its once active crater is filled up, and we find a convex surface ("The Plain of Rambleta") surmounted towards its eastern end by a diminutive cone, 500 feet high, called "Humboldt's Ash Cone." The slope of the great cone of Teneriffe ranges from 28° to 38°; and below a level of 7000 feet the general slope of the whole mountain down to the water's edge varies from 10° to 12° from the horizontal. The great cone is penetrated by numerous basaltic dykes.

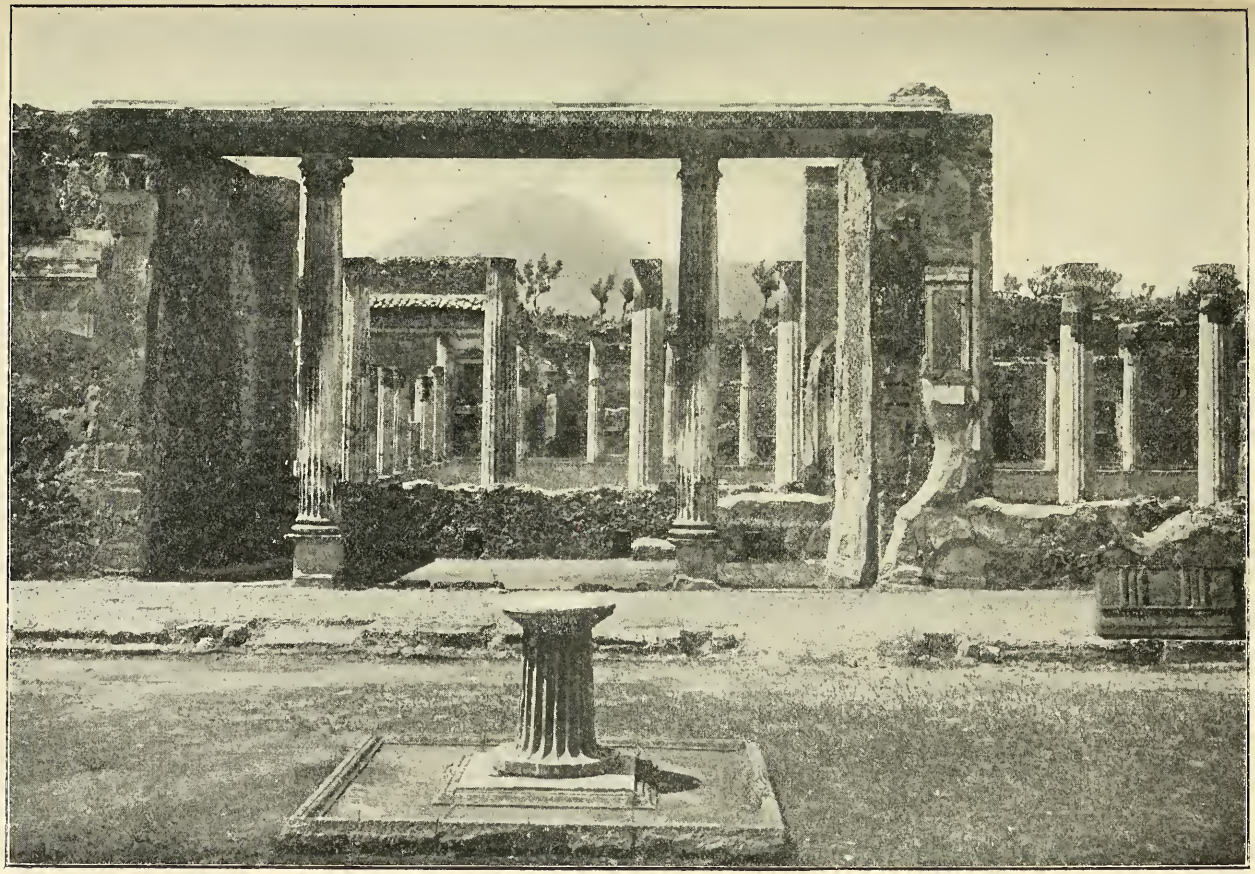
The Cape de Verde Islands, which contain beds of limestone along with volcanic matter, possess in the island of Fuego an active volcano, rising to a height of 7000 feet above the surface of the ocean. The central cone, like that of Teneriffe, rises from within an outer crater, formed of basalt alternating with beds of agglomerate, and traversed by numerous dykes of lava. This has been broken down on one side like that of Somma; and over its flanks are scattered numerous cones of scoria, the most recent dating from the years 1785 and 1799.

BIRD'S-EYE VIEW OF THE RUINS OF POMPEII

EXCAVATED PORTION OF THE STREET CALLED STRADIA IN POMPEII, WHICH WAS BURIED UNDER THE ASHES



SCENE IN POMPEII SHOWING STREET OF SEPULCHRES



RUINS OF HOUSE OF THE FAWN, POMPEII—SHOWING MOUNT VESUVIUS IN THE DISTANCE

CHAPTER XVIII.

Amazing Phenomena Connected with Volcanoes and Earthquakes.—Fiery Explosions and Mountains in Convulsions.—Changes in the Surface of the Earth.

BY SIR JOHN F. W. HERSCHEL, BART.

[The following accurate and scientific account of the causes and effects of volcanoes and earthquakes is furnished by the most eminent authority on these subjects known to the world, and is of special interest in connection with the great disasters in the Islands of Martinique and St. Vincent.]

I PURPOSE to say something about volcanoes and earthquakes. It is a subject I have thought a good deal about, and seen a little of, for though I have never been so fortunate as to have seen a volcano in eruption, or to have been shaken out of my bed by an earthquake, still I have climbed the cones of Vesuvius and Etna, hammer in hand and barometer on back, and have wandered over and geologized among, I believe, nearly all the principal scenes of extinct volcanic activity in Europe, those of Spain excepted.

Every one knows that a volcano is a mountain that vomits out fire, and smoke, and cinders, and melted lava, and sulphur, and steam, and gases, and all kinds of horrible things; nay, even sometimes mud, and boiling water, and fishes; and everybody has heard or read of the earth opening, and swallowing up man and beast, and houses and churches; and closing on them with a snap, and smashing them to pieces; and then perhaps opening again, and casting them out with a flood of dirty water from some river or lake that has been gulped down with them. Now, all this, and much more, is literally true, and has happened over and over again; and when we have imagined it all, we shall have formed a tolerably correct notion of some at least of these visitations.

And perhaps some may have been tempted to ask why and how it is that God has permitted this fair earth to be visited with such destruction. It can hardly be for the sins of men : for when these things occur they involve alike the innocent and the guilty ; and besides, the volcano and the earthquake were raging on this earth with as much, nay greater violence, thousands and thousands of years before man set foot upon it. But perhaps, on the other hand, it may have occurred to some to ask themselves whether it is not just possible that these ugly affairs are sent among us for some beneficent purposes ; or at all events that they may form part and parcel of some great scheme of providential arrangement which is at work for good and not for ill.

INCIDENTAL CATASTROPHES.

A ship sometimes strikes on a rock, and all on board perish ; a railway train runs into another, or breaks down, and then wounds and contusions are the order of the day ; but nobody doubts that navigation and railway communication are great blessings. None of the great natural provisions for producing good are exempt in their workings from producing occasional mischief. Storms disperse and dilute pestilental vapors, and lightnings decompose and destroy them ; but both the one and the other often annihilate the works of man, and inflict upon him sudden death.

Well, then, I think I shall be able to show that the volcano and the earthquake, dreadful as they are, as local and temporary visitations, are in fact unavoidable (I had almost said necessary) incidents in a vast system of action to which we owe the very ground we stand upon, the very land we inhabit, without which neither man, beast, nor bird would have a place for their existence, and the world would be the habitation of nothing but fishes.

Now, to make this clear, I must go a little out of my way and say something about the first principles of geology. Geology does not pretend to go back to the creation of the world, or concern itself about its primitive state, but it does concern itself with the changes it sees going on in it now, and with the evidence of a long series of such changes it can produce in the most unmistakable

features of the structure of our rocks and soil, and the way in which they lie one on the other.

As to what we see going on.—We see everywhere, and along every coast-line, the sea warring against the land, and everywhere overcoming it; wearing and eating it down, and battering it to pieces; grinding those pieces to powder; carrying the powder away, and spreading it out over its own bottom, by the continued effect of the tides and currents. Look at our chalk cliffs, which once, no doubt, extended across the Channel to the similar cliffs on the French coast.

What do we see? Precipices cut down to the sea-beach, constantly hammered by the waves and constantly crumbling: the beach itself made of the flints outstanding after the softer chalk had been ground down and washed away; themselves grinding one another under the same ceaseless discipline; first rounded into pebbles, then worn into sand, and then carried out farther and farther down the slope, to be replaced by fresh ones from the same source.

PROCESSES GOING ON.

Well, the same thing is going on everywhere, round every coast of Europe, Asia, Africa and America. Foot by foot or inch by inch, month by month or century by century, down everything must go. Time is as nothing in geology. And what the sea is doing the river is helping it to do. Look at the sand-banks at the mouth of the Thames. What are they but the materials of our island carried out to sea by the stream? The Ganges carries away from the soil of India, and delivers into the sea, twice as much solid substance weekly as is contained in the great pyramid of Egypt. The Irawaddy sweeps off from Burmah sixty-two cubic feet of earth in every second of time on an average, and there are 86,400 seconds in every day, and 365 days in every year; and so on for the other rivers.

What has become of all that great bed of chalk which once covered all the weald of Kent, and formed a continuous mass from Ramsgate and Dover to Beechy Head, running inland to Madams-

court Hill and Seven Oaks? All clean gone, and swept out into the bosom of the Atlantic, and there forming other chalk-beds. Now, geology assures us, on the most conclusive and undeniable evidence, that all our present land, all our continents and islands have been formed in this way out of the ruins of former ones. The old ones which existed at the beginning of things have all perished, and what we now stand upon has most assuredly been, at one time or other, perhaps many times, the bottom of the sea.

Well, then, there is power enough at work, and it has been at work long enough utterly to have cleared away and spread over the bed of the sea all our present existing continents and islands, had they been placed where they are at the creation of the world; and from this it follows as clear as demonstration can make it, that without some process of renovation and restoration to act in antagonism to this destructive work of old Neptune, there would not now be remaining a foot of dry land for living thing to stand upon.

WERE HOISTED AT ONE BLOW.

Now, what is this process of restoration? Let the volcano and the earthquake tell their tale. Let the earthquake tell how, within the memory of man—under the eyesight of eye-witnesses, one of whom (Mrs. Graham) has described the fact—the whole coast line of Chili, for one hundred miles about Valparaiso, with the mighty chain of the Andes—mountains to which the Alps sink into insignificance—was hoisted at one blow (in a single night, Nov. 19, A. D. 1822) from two to seven feet above its former level, leaving the beach below the old water mark high and dry; leaving the shell-fish sticking on the rocks out of reach of water; leaving the seaweed rotting in the air, or rather drying up to dust under the burning sun of a coast where rain never falls.

The ancients had a fable of Titan hurled from heaven and buried under Etna, and by his struggles causing the earthquakes that desolated Sicily. But here we have an exhibition of Titanic forces on a far mightier scale. One of the Andes upheaved on this occasion was the gigantic mass of Aconagva, which overlooks Valparaiso. To bring home to the mind the conception of such

an effort, we must form a clear idea of what sort of mountain this is. It is nearly 24,000 feet in height.

Chimborazo, the loftiest of the volcanic cones of the Andes, is lower by 2,500 feet; and yet Etna, with Vesuvius at the top of it, and another Vesuvius piled on that, would little more than surpass the midway portion of the snow-covered portion of that cone, which is one of the many chimneys by which the hidden fires of the Andes fine vent. On the occasion I am speaking of, at least ten thousand square miles of country were estimated as having been upheaved, and the upheaval was not confined to the land, but extended far away to sea, which was proved by the soundings off Valparaiso and along the coast, having been found considerably shallower than they were before the shock.

Again, in the year 1819, in an earthquake in India, in the district of Cutch, bordering on the Indus, a tract of country more than fifty miles long and sixteen broad was suddenly raised ten feet above its former level. The raised portion still stands up above the unraised like a long perpendicular wall, which is known by the name of the "Ullah Bund," or "God's Wall."

GIGANTIC UPHEAVALS.

And again, in 1538, in that convulsion which threw up the Monte Nuovo (New Mountain), a cone of ashes 450 feet high, in a single night; the whole coast of Pozzuoli, near Naples, was raised twenty feet above its former level, and remains so permanently upheaved to this day. And I could mention innumerable other instances of the same kind.

This, then, is the manner in which the earthquake does its work; and it is always at work. Somewhere or other in the world, there is perhaps not a day, certainly not a month, without an earthquake. In those districts of South and Central America, where the great chain of volcanic cones is situated—Chimborazo, Cotopaxi, and a long list with names unmentionable, or at least unpronounceable—the inhabitants no more think of counting earthquake shocks than we do of counting showers of rain.

Indeed, in some places along the coast, a shower is a greater

rarity. Even in our own island, near Perth, a year seldom passes without a shock, happily, within the records of history, never powerful enough to do any mischief.

It is not everywhere that this process goes on by fits and starts. For instance, the northern gulfs, and borders of the Baltic Sea, are steadily shallowing; and the whole mass of Scandinavia including Norway, Sweden and Lapland, is rising out of the sea at the average rate of about two feet per century. But as this fact (which is perfectly well established by reference to ancient high and low water marks) is not so evidently connected with the action of earthquakes, I shall not refer to it just now.

All that I want to show is, that there is a great cycle of changes going on, in which the earthquake and volcano act a very conspicuous part, and that part a restorative and conservative one; in opposition to the steadily destructive and leveling action of the ocean waters.

CAUSES OF THE PHENOMENA.

How this can happen; what can be the origin of such an enormous power thus occasionally exerting itself, will no doubt seem very marvelous—little short, indeed, of miraculous intervention—but the mystery, after all, is not quite so great as at first seems. We are permitted to look a little way into these great secrets; not far enough, indeed, to clear up every difficulty, but quite enough to penetrate us with admiration of that wonderful system of counterbalances and compensations; that adjustment of causes and consequences, by which, throughout all nature, evils are made to work their own cure; life to spring out of death; and renovation to tread in the steps and efface the vestiges of decay.

The key to the whole affair is to be found in the central heat of the earth. This is no scientific dream, no theoretical notion, but a fact established by direct evidence up to a certain point, and standing out from plain facts as a matter of unavoidable conclusion, in a hundred ways.

We all know that when we go into a cellar out of a summer

sun it feels cool; but when we go into it out of a wintry frost it is warm. The fact is, that a cellar, or a well, or any pit of a moderate depth, has always, day and night, summer and winter, the same degree of warmth, the same temperature, as it is called; and that always and everywhere is the same, or nearly the same, as the average warmth of the climate of the place. Forty or fifty feet deep in the ground, the thermometer here in this spot, would always mark the same degree, 49°, that is, or seventeen degrees above the freezing point. Under the equator, at the same depth, it always stands at 84°, which is our hot summer heat, but which there is the average heat of the whole year.

And this is so everywhere. Just at the surface, or a few inches below it, the ground is warm in the daytime, cool at night; at two or three feet deep the difference of day and night is hardly perceptible, but that of summer and winter is considerable. But at forty or fifty feet this difference also disappears, and you find a perfectly fixed, uniform degree of warmth, day and night; summer and winter; year after year.

HOTTER AS WE GO DOWN.

But when we go deeper, as, for instance, down into mines or coal-pits, this one broad and general fact is always observed—everywhere, in all countries, in all latitudes, in all climates, wherever there are mines, or deep subterranean caves—the deeper you go, the hotter the earth is found to be. In one and the same mine, each particular depth has its own particular degree of heat, which never varies: but the lower always the hotter; and that not by a trifling, but what may well be called an astonishingly rapid rate of increase—about a degree of the thermometer additional warmth for every 90 feet of additional depth, which is about 58° per mile!—so that, if we had a shaft sunk a mile deep, we should find in the rock a heat of 105°, which is much hotter than the hottest summer day ever experienced

It is not everywhere, however, that it is worth while to sink a shaft to any great depth; but borings for water (in what are called Artesian wells) are often made to enormous depths, and the

water always comes up hot ; and the deeper the boring, the hotter the water. There is a very famous boring of this sort in Paris, at La Grenelle. The water rises from a depth of 1794 feet, and its temperature is 82° of our scale, which is almost that of the equator. And, again, at Salzwerth, in Oeynhausen, in Germany, in a boring for salt springs 2144 feet deep, the salt water comes up with with a still higher heat, viz., 91°.

Then, again, we have natural hot water springs, which rise, it is true, from depths we have no means of ascertaining ; but which, from the earliest recorded times, have always maintained the same heat. At Bath, for instance, the hottest well is 117° Fahr. On the Arkansas River, in the United States, is a spring of 180°, which is scalding hot ; and that out of the neighborhood of any volcano.

MASS OF RED-HOT IRON.

Now, only consider what sort of a conclusion this lands us in. This globe of ours is 8000 miles in diameter ; a mile deep on its surface is a mere scratch. If a man had twenty greatcoats on, and I found under the first a warmth of 60° above the external air, I should expect to find 60° more under the second, and 60° more under the third, and so on ; and, within all, no man, but a mass of red-hot iron.

Just so with the outside crust of the earth. Every mile thick is such a greatcoat, and at twenty miles depth, according to this rate, the ground must be fully red-hot ; and at no such very great depth beyond, either the whole must be melted, or only the most infusible and intractable kinds of material, such as our fireclays and flints, would present some degree of solidity.

In short, what the icefloes and icebergs are to the polar seas, so we shall come to regard our continents and mountain-ranges in relation to the ocean of melted matter beneath. I do not mean to say there is no solid central mass ; there may be one, or there may not, and, upon the whole, I think it likely enough that there is—kept solid, in spite of the heat, by the enormous pressure ; but that has nothing to do with the present argument.

All that I contend for is this.—Grant me a sea of liquid fire, on which we are all floating—land and sea ; for the bottom of the sea anyhow will not come nearly down to the lava level. The sea is probably nowhere more than five or six miles deep, which is far enough above that level to keep its bed from becoming red-hot.

Well, now, the land is perpetually wearing down, and the materials being carried out to sea. The coat of heavier matter is thinning off towards the land, and thickening over all the bed of the sea. What must happen ? If a ship float even on her keel, transfer weight from the starboard to her larboard side, will she continue to float even ? No, certainly. She will heel over to larboard. Many a good ship has gone to the bottom in this way. If the continents be lightened, they will rise ; if the bed of the sea receive additional weight, it will sink.

BOTTOM OF THE OCEAN SINKING.

The bottom of the Pacific is sinking, in point of fact. Not that the Pacific is becoming deeper. This seems a paradox ; but it is easily explained. The whole bed of the sea is in the act of being pressed down by the laying on of new solid substance over its bottom. The new bottom then is laid upon the old, and so the actual bed of the ocean remains at or nearly at the same distance from the surface water. But what becomes of the islands ? They form part and parcel of the old bottom ; and Dr. Darwin has shown, by the most curious and convincing proofs, that they are sinking, and have been sinking for ages, and are only kept above water—by what, think you? By the labors of the coral insects, which always build up to the surface !

It is impossible but that this increase of pressure in some places and relief in others must be very unequal in their bearings. So that at some place or other this solid floating crust must be brought into a state of strain, and if there be a weak or soft part, a crack will at last take place. When this happens, down goes the land on the heavy side and up on the light side. Now this is exactly what took place in the earthquake which raised the Ullah Bund in Cutch.

I have told you of a great crack drawn across the country, not far from the coast line ; the inland country rose ten feet, but much of the sea-coast, and probably a large tract in the bed of the Indian Ocean, sank considerably below its former level. And just as you see when a crack takes place in ice, the water oozes up ; so this kind of thing is always, or almost always, followed by an upburst of the subterranean fiery matter. The earthquake of Cutch was terminated by the outbreak of a volcano at the town of Bhooi, which it destroyed.

Now where, following out this idea, should we naturally expect such cracks and outbreaks to happen? Why, of course, along those lines where the relief of pressure on the land side is the greatest, and also its increase on the sea side ; that is to say, along or in the neighborhood of the sea-coasts, where the destruction of the land is going on with most activity.

CLOSE TO THE COAST LINE.

Well, now, it is a remarkable fact in the history of volcanoes, that there is hardly an instance of an active volcano at any considerable distance from the sea cost. All the great volcanic chain of the Andes is close to the western coast line of America. Etna is close to the sea ; so is Vesuvius ; Teneriffe is very near the African coast ; Mount Erebus is on the edge of the great Antartic continent.

Out of 225 volcanoes which are known to be in actual eruption over the whole earth within the last 150 years, I remember only a single instance of one more than 320 miles from the sea, and that is on the edge of the Caspian, the largest of the inland seas —I mean Mount Demawend in Persia.

Suppose from this, or any other cause, a crack to take place in the crust of the earth. Don't imagine that the melted matter below will simply ooze up quietly, as water does from under an ice-crack. No such thing. There is an element in the case we have not considered ; steam and condensed gases. We all know what takes place in a high pressure steam-boiler, with what violence the contents escape, and what havoc takes place.

Now there is no doubt that among the minerals of the subterranean world, there is water in abundance, and sulphur, and many other vaporizable substances, all kept subdued and repressed by the enormous pressure. Let this pressure be relieved, and forth they rush, and the nearer they approach the surface the more they expand, and the greater is the explosive force they acquire; till at length, after more or fewer preparatory shocks, each accompanied with progressive weakening of the overlying strata, the surface finally breaks up, and forth rushes the imprisoned power, with all the awful violence or a volcanic eruption.

Certainly a volcano does seem to be a very bad neighbor; and yet it affords a compensation in the extraordinary richness of the volcanic soil, and the fertilizing quality of the ashes thrown out. The flanks of Somma (the exterior crater of Vesuvius) are covered with vineyards producing wonderful wine, and whoever has visited Naples, will not fail to be astonished at the productiveness of volcanized territory as contrasted with the barrenness of the limestone rocks bordering on it.

THREE CROPS AT ONCE.

There you will see the amazing sight (as an English farmer would call it) of a triple crop growing at once on the same soil; a vineyard, an orchard, and a cornfield all in one. A magnificent wheat crop, five or six feet high, overhung with clustering grapevines swinging from one apple or pear tree to another in the most luxuriant festoons! When I visited Somma, to see the country where the celebrated wine, the Lacryma Christi, is grown, it was the festival of Madonna del Arco. Her church was crowded to suffocation with a hot and dusty assemblage of the peasantry. The fine impalpable volcanic dust was everywhere; in your eyes, in your mouth, begriming every pore; and there I saw what I shall never forget. Jammed among the crowd, I felt something jostling my legs.

Looking down, and the crowd making way, I beheld a line of worshipers crawling on their hands and knees from the door of the church to the altar, licking the dusty pavement all the way

with their tongues, positively applied to the ground and no mistake. No trifling dose of Lacryma would be required to wash down what they must have swallowed on that journey, and I have no doubt it was administered pretty copiously after the penance was over.

Now I come to consider the manner in which an earthquake is propagated from place to place; how it travels, in short. It runs along the earth precisely in the same manner, and according to the same mechanical laws as a wave along the sea, or rather as the waves of sound run along the air, but quicker.

The earthquake which destroyed Lisbon ran out from thence, as from a centre, in all directions, at a rate averaging about twenty miles per minute, as far as could be gathered from a comparison of the time of its occurrence at different places; but there is little doubt that it must have been retarded by having to traverse all sorts of ground, for a blow or shock of any description is conveyed through the substance on which it is delivered with the rapidity of sound in that substance.

SOUND CONVEYED BY WATER.

Perhaps it may be new to many to be told that sound is conveyed by water, by stone, by iron, and indeed, by everything, and at a different rate for each. In air it travels at the rate of about 1140 feet per second, or about thirteen miles a minute. In water much faster, more than four times as fast (4700 feet). In iron ten times as fast (11,400 feet), or about 130 miles in a minute, so that a blow delivered endways at one end of an iron rod, 130 miles long, would only reach the other after a lapse of a minute, and a pull at one end of an iron wire of that length, would require a minute before it would be felt at the other.

But the substance of the earth through which the shock is conveyed is not only far less elastic than iron, but it does not form a coherent, connected body; it is full of interruptions, cracks, loose materials, and all of these tend to deaden and retard the shock; and putting together all the accounts of all the earthquakes that have been exactly observed, their rate of travel may

be taken to vary from as low as twelve or thirteen miles a minute to seventy or eighty; but perhaps the low velocities arise from oblique waves.

The way, then, that we may conceive an earthquake to travel is this—I shall take the case which is most common, when the motion of the ground to-and-fro is horizontal. How far each particular spot on the surface of the ground is actually pushed from its place there is no way of ascertaining, since all the surrounding objects receive the same impulse almost at the same instant of time, but there are many indications that it is often several yards.

GROUND SMITTEN BY TREES

In the earthquake of Cutch, which I have mentioned, trees were seen to flog the ground with their branches, which proves that their stems must have been jerked suddenly away for some considerable distance and as suddenly pushed back; and the same conclusion follows from the sudden rise of the water of lakes on the side where the shock reaches them, and its fall on the opposite side; the bed of the lake has been jerked away for a certain distance from under the water and pulled back.

Now, suppose a row of sixty persons, standing a mile apart from each other, in a straight line, in the direction in which the shock travels; at a rate, we will suppose, of sixty miles per minute; and let the ground below the first get a sudden and violent shove, carrying it a yard in the direction of the next. Since this shock will not reach the next till after the lapse of one second of time, it is clear that the space between the two will be shortened by a yard, and the ground—that is to say, not the mere loose soil on the surface, but the whole mass of solid rock below, down to an unknown depth—compressed, or driven into a smaller space.

It is this compression that carries the shock forwards. The elastic force of the rocky matter, like a coiled spring acts both ways; it drives back the first man to his old place, and shoves the second a yard nearer the third, and so on. Instead of men place a row of tall buildings, or columns, and they will tumble down in

succession, the base flying forwards, and leaving the top behind to drop on the soil on the side from which the shock came.

This is just what has happened in Messina in the great Catlabrian earthquake. As the shock ran along the ground, the houses of the Faro were seen to topple down in succession; beginning at one end and running on to the other, as if a succession of mines had been sprung. In the earthquake in Cutch, a sentinel standing at one end of a long straight line of wall, saw the wall bow forward and recover itself; not all at once, but with a swell like a wave running all along it with immense rapidity.

In this case it is evident that the earthquake wave must have its front oblique to the direction of the wall (just as an obliquely-held rule runs along the edge of a page of paper while it advances, like a wave of the sea, perpendicularly to its own length).

CONCERNING EXTINCT VOLCANOES.

In reference to extinct volcanoes, I may just mention that any one who wishes to see some of the finest specimens in Europe may do so by making a couple of days' railway travel to Clermont, in the department of the Puy-de-Dome in France. There he will find a magnificent series of volcanic cones, fields of ashes, streams of lavas, and basaltic terraces of platforms, proving the volcanic action to have been continued for countless ages before the present surface of the earth was formed; and all so clear that he who runs may read their lesson. There can there be seen a configuration of surface quite resembling what telescopes show in the most volcanic districts of the moon. Let not my hearers be startled; half the moon's face is covered with unmistakable craters of extinct volcanoes.

Many of the lavas of Auvergne and the Puy-de-Dome are basaltic; that is, consisting of columns placed close together; and some of the cones are quite complete, and covered with loose ashes and cinders, just as Vesuvius is at this hour.

In the study of these vast and awful phenomena we are brought in contact with those immense and rude powers of nature which seem to convey to the imagination the impress of brute

force and lawless violence; but it is not so. Such an idea is not more derogatory to the wisdom and benevolence that prevails throughout all the scheme of creation than it is in itself erroneous. In their wildest paroxysms the rage of the volcano and the earthquake is subject to great and immutable laws: they feel the bridle and obey it.

The volcano bellows forth its pent-up overplus of energy and sinks into long and tranquil repose. The earthquake rolls away, and industry, that balm which nature knows how to shed over every wound, effaces its traces, and festoons its ruins with flowers. There is mighty and rough work to be accomplished, and it cannot be done by gentle means. It seems, no doubt, terrible, awful, perhaps harsh, that twenty or thirty thousand lives should be swept away in a moment by a sudden and unforeseen calamity; but we must remember that sooner or later every one of those lives must be called for, and it is by no means the most sudden end that is the most afflictive.

NATURE'S TREMENDOUS ENERGIES.

It is well too that we should contemplate occasionally, if it were only to teach us humility and submission, the immense energies which are everywhere at work in maintaining the system of nature we see going on so smoothly and tranquilly around us, and of which these furious outbreaks, after all, are but minute, and for the moment unbalanced surpluses in the great account. The energy requisite to overthrow a mountain is as a drop in the ocean compared with that which holds it in its place, and makes it a mountain. Chemistry tells us that the forces constantly in action to maintain a single grain of water in its habitual state, when only partially and sparingly let loose in the form of electricity, would manifest themselves as a powerful flash of lightning.

And we learn from optical science that in even the smallest element of every material body, nay, even in what we call empty space, there are forces in perpetual action to which even such energies sink into insignificance. Yet, amid all this, nature holds her even course: the flowers blossom; animals enjoy their

brief span of existence ; and man has leisure and opportunity to contemplate and adore, secure of the watchful care which provides for his well-being at every instant that he is permitted to remain on earth.

The first great earthquake of which any very distinct knowledge has reached us is that which occurred in the year 63 after our Saviour, which produced great destruction in the neighborhood of Vesuvius, and shattered the cities of Pompeii and Herculaneum upon the Bay of Naples, though it did not destroy them. This earthquake is chiefly remarkable as having been the forerunner and the warning (if that warning could have been understood) of the first eruption of Vesuvius on record, which followed sixteen years afterwards in the year 79.

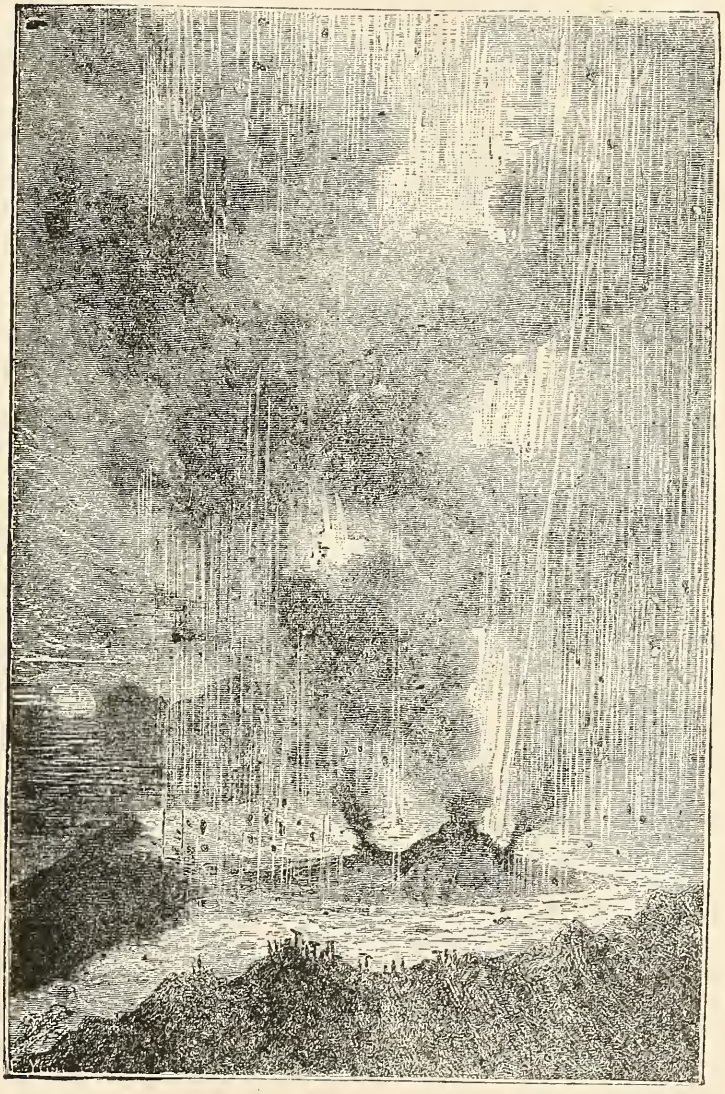
DID NOT KNOW IT WAS A VOLCANO.

Before that time none of the ancients had any notion of its being a volcano, though Pompeii itself is paved with its lava. The crater was probably filled, or at least the bottom occupied, by a lake; and we read of it as the stronghold of the rebel chief Spartacus, who, when lured there by the Roman army, escaped with his followers by clambering up the steep sides by the help of the wild vines that festooned them. The ground since the first earthquake in 63 had often been shaken by slight shocks, when at length, in August 79, they became more numerous and violent, and, on the night preceding the eruption, so tremendous as to threaten everything with destruction.

A morning of comparative repose succeeded, and the terrified inhabitants of those devoted towns no doubt breathed more freely, and hoped the worst was over, when, about one o'clock in the afternoon, the Elder Pliny, who was stationed in command of the Roman fleet at Misenum in full view of Vesuvius, beheld a huge black cloud ascending from the mountain, which, "rising slowly always higher," at last spread out aloft like the head of one of those picturesque flat-topped pines which form such an ornament of the Italian landscape.

The meaning of such a phenomenon was to Pliny and to

everyone a mystery. We know now too well what it imports, and they were not long left in doubt. From that cloud descended



TERRIFIC ERUPTION OF THE GREAT CRATER OF VESUVIUS.

stones, ashes, and pumice; and the cloud itself lowered down upon the surrounding country, involving land and sea in profound darkness, pierced by flashes of fire more vivid than lightning.

These, with the volumes of ashes that began to encumber the soil, and which covered the sea with floating pumice-stone; the constant heaving of the ground; and the sudden recoil of the sea, form a picture which is wonderfully well described by the the Younger Pliny. His uncle, animated by an eager desire to know what was going on, and to afford aid to the inhabitants of the towns, made sail for the nearest point of the coast and landed; but was instantly enveloped in the dense sulphureous vapor that swept down from the mountain, and perished miserably.

It does not seem that any lava flowed on that occasion. Pompeii was buried under the ashes; Herculaneum by a torrent of mud, probably the contents of the crater, ejected at the first explosion. This was most fortunate. We owe to it the preservation of some of the most wonderful remains of antiquity. For it is not yet much more than a century ago that, in digging a well at Portici near Naples, the Theatre of Herculaneum was discovered, some sixty feet under ground,—then houses, baths, statues, and, most interesting of all, a library full of books; and those books still legible, and among them the writings of some ancient authors which had never before been met with, but which have now been read, copied, and published, while hundreds and hundreds, I am sorry to say, still remain unopened.

Pompeii was not buried so deep; the walls of some of the buildings appeared among the modern vineyards, and led to excavations which were easy, the ashes being light and loose. And there you now may walk through the streets, enter the houses and find the skeletons of their inmates, some in the very act of trying to escape. Nothing can be more strange and striking.

Since that time Vesuvius has been frequently, but very irregularly, in eruption. The next after Pompeii was in the year 202, under Severus, and in 472 occurred an eruption so tremendous that all Europe was covered by the ashes, and even Constantinople thrown into alarm. This may seem to savor of the marvelous, but before I have done I hope to show that it is not beyond what we know of the power of existing volcanoes.

CHAPTER XIX.

GREAT VOLCANIC ERUPTIONS IN MANY PARTS OF THE WORLD. STORY OF MT. ETNA.—CONVULSIONS IN SOUTH AMERICA AND ELSEWHERE.

I SHALL not, of course, occupy attention with a history of Vesuvius, but pass at once to the eruption of 1779—one of the most interesting on record, from the excellent account given of it by Sir William Hamilton, who was then resident at Naples as our Minister, and watched it throughout with the eye of an artist as well as the scrutiny of a philosopher.

In 1767, there had been a considerable eruption, during which Pliny's account of the great pine-like, flat-topped, spreading mass of smoke had been superbly exemplified; extending over the Island of Capri, which is twenty-eight miles from Vesuvius. The showers of ashes, the lava currents, the lightnings, thunderings, and earthquakes were very dreadful; but they were at once brought to a close when the mob insisted that the head of St. Januarius should be brought out and shown to the mountain; and when this was done, all the uproar ceased on the instant, and Vesuvius became as quiet as a lamb!

He did not continue so, however, and it would have been well for Naples if the good Saint's head could have been permanently fixed in some conspicuous place in sight of the hill—for from that time till the year 1779 it never was quiet.

In the spring of that year it began to pour out lava; and on one occasion, when Sir William Hamilton approached too near, the running stream was on the point of surrounding him; and the sulphureous vapor cut off his retreat, so that his only mode of escape was to walk across the lava, which, to his astonishment, and, no doubt, to his great joy, he found accompanied with no difficulty, and with no more inconvenience than what proceeded from the radiation of heat on his legs and feet from the scoriæ and cinders with which the external crust of the lava was loaded;

and which in great measure intercepted and confined the glowing heat of the ignited mass below.

In such cases, and when cooled down to a certain point, the motion of the lava-stream is slow and creeping; rather rolling over itself than flowing like a river; the top becoming the bottom, owing to the toughness of the half-congealed crust. When it issues, however, from any accessible vent, it is described as perfectly liquid, of an intense white heat, and spouting or welling forth with extreme rapidity.

So Sir Humphrey Davy described it in an eruption at which he was present; and so Sir William Hamilton, in the eruption we are now concerned with, saw it "bubbling up violently" from one of its fountains on the slope of the volcano, "with a hissing and crackling noise, like that of an artificial firework; and forming, by the continual splashing up of the vitrified matter, a sort of dome or arch over the crevice from which it issued," which was all, internally, "red-hot like a heated oven."

RUMBLING NOISES AND EXPLOSIONS.

However, as time went on, this quiet mode of getting rid of its contents would no longer suffice, and the usual symptoms of more violent action—rumbling noises and explosions within the mountain; puffs of smoke from its crater, and jets of red-hot stones and ashes—continued till the end of July, when they increased to such a degree as to exhibit at night the most beautiful firework imaginable.

The eruption came to its climax from the 5th to the 10th of August, on the former of which days, after the ejection of an enormous volume of white clouds, piled like bales of the whitest cotton, in a mass exceeding four times the height and size of the mountain itself; the lava began to overflow the rim of the crater, and stream in torrents down the steep slope of the cone. This was continued till the 8th, when the great mass of the lava would seem to have been evacuated, and no longer repressing by its weight the free discharge of the imprisoned gases, allowed what remained to be ejected in fountains of fire, carried up to an

immense height in the air. The description of one of these I must give in the picturesque and vivid words of Sir William Hamilton himself.

"About nine o'clock," he says, on Sunday the 8th of August, "there was a loud report, which shook the houses at Portici and

NAPLES, SHOWING MOUNT VESUVIUS IN THE DISTANCE.

its neighborhood to such a degree as to alarm the inhabitants and drive them out into the streets. Many windows were broken, and as I have since seen, walls cracked by the concussion of the air from that explosion. In one instant a fountain of liquid transparent fire began to rise, and gradually increasing, arrived at so amazing a height as to strike every one who beheld it with the most awful astonishment. I shall scarcely be credited when I

assure you that, to the best of my judgment, the height of this stupendous column of fire could not be less than three times that of Vesuvius itself; which, you know, rises perpendicularly near 3,700 feet above the level of the sea." (The height of my own measurement in 1824 is 3,920 feet.)

"Puffs of smoke, as black as can possibly be imagined, suceeded one another hastily, and accompanied the red-hot, transparent, and liquid lava, interrupting its splendid brightness here and there by patches of the darkest hue. Within these puffs of smoke, at the very moment of their emission from the crater, I could perceive a bright but pale electrical fire playing about in zigzag lines.

THROWN UPWARD THOUSANDS OF FEET.

"The liquid lava, mixed with scoriæ and stones, after having mounted, I veritably believe at least 10,000 feet, falling perpendicularly on Vesuvius, covered its whole cone, part of that of Somma, and the valley between them. The falling matter being nearly as vivid and inflamed as that which was continually issuing fresh from the crater, formed with it one complete body of fire, which could not be less than two miles and a half in breadth, and of the extraordinary height above mentioned; casting a heat to the distance of at least six miles around it.

"The brushwood of the mountain of Somma was soon in flame, which, being of a different tint from the deep red of the matter thrown out from the volcano, and from the silvery blue of the electrical fire, still added to the contrast of this most extraordinary scene. After the column of fire had continued in full force for nearly half an hour, the eruption ceased at once, and Vesuvius remained sullen and silent."

The lightnings here described arose evidently in part from the chemical activity of gaseous decompositions going forward, in part to the friction of steam, and in part from the still more intense friction of the dust, stones and ashes encountering one another in the air, in analogy to the electric manifestations which accompany the dust storms in India.

To give an idea of the state of the inhabitants of the country when an explosion is going on, I will make one other extract:—"The mountain of Somma, at the foot of which Ottaiano is situated, hides Vesuvius from its sight, so that, until the eruption became considerable, it was not visible to them. On Sunday night, when the noise increased and the fire began to appear above the mountain of Somma, many of the inhabitants of the town flew to the churches, and others were preparing to quit the town, when a sudden violent report was heard, soon after which they found themselves involved in a thick cloud of smoke and minute ashes; a horrid clashing noise was heard in the air, and presently fell a deluge of stones and large scoriæ, some of which scoriæ were of the diameter of seven or eight feet, and must have weighed more than one hundred pounds before they were broken by their falls, as some of the fragments of them which I picked up in the streets still weighed upwards of sixty pounds.

GLEAMING SPARKS OF FIRE.

"When the large vitrified masses either struck against each other in the air or fell on the ground, they broke in many pieces, and covered a large space around them with vivid sparks of fire, which communicated their heat to everything that was combustible. In an instant the town and country about it was on fire in many parts; for in the vineyards there were several straw huts which had been erected for the watchmen of the grapes, all of which were burnt. A great magazine of wood in the heart of the town was all in a blaze, and had there been much wind, the flames must have spread universally, and all the inhabitants would have infallibly been burnt in their houses, for it was impossible for them to stir out.

"Some who attempted it with pillows, tables, chairs, tops of wine casks, etc., on their heads, were either knocked down or driven back to their close quarters under arches or in the cellars of the houses. Many were wounded, but only two persons have died of the wounds they received from this dreadful volcanic shower. To add to the horror of the scene, incessant volcanic lightning was

writhing about the black cloud that surrounded them, and the sulphurous smell and heat would scarcely allow them to draw their breath."

The next volcano I shall introduce is Ætna, the grandest of all our European volcanoes. I ascended it in 1824, and found its height by a very careful barometric measurement to be 10,772 feet above the sea, which, by the way, agrees within some eight or ten feet with Admiral Smyth's measurement.

The scenery of Ætna is on the grandest scale. Ascending from Catania you skirt the stream of lava which destroyed a part of that city in 1669, and which ran into the sea, forming a jetty or breakwater that now gives Catania what it never had before, the advantage of a harbor. There it lies as hard, rugged, barren, and fresh-looking as if it had flowed but yesterday. In many places it is full of huge caverns; great air-bubbles, into which one may ride on horseback (at least large enough) and which communicate, in a succession of horrible vaults, where one might wander and lose one's self without hope of escape.

BRISTLING WITH SMALL VOLCANOES.

Higher up, near Nicolosi, is the spot from which that lava flowed. It is marked by two volcanic cones, each of them a considerable mountain, called the Monti Rossi, rising 300 feet above the slope of the hill, and which were thrown up on that occasion. Indeed, one of the most remarkable features of Ætna is that of its flanks bristling over with innumerable smaller volcanoes. For the height is so great that the lava now scarcely ever rises to the top of the crater; for before that, its immense weight breaks through at the sides.

In one of the eruptions that happened in the early part of the century, I forget the date, but I think it was in 1819, and which was described to me on the spot by an eye-witness—the Old Man of the Mountain, Mario Gemellaro—the side of Ætna was rent by a great fissure or crack, beginning near the top, and throwing out jets of lava from openings fourteen or fifteen in number all the way down, so as to form a row of fiery fountains rising from dif-

ferent levels, and all ascending nearly to the same height : thereby proving them all to have originated in the great internal cistern as it were, the crater being filled up to the top level.

From the summit of Ætna extends a view of extraordinary magnificence. The whole of Sicily lies at your feet, and far beyond it are seen a string of lesser volcanoes; the Lipari Islands, between Sicily and the Italian coast ; one of which, Stromboli, is always in eruption, unceasingly throwing up ashes, smoke, and liquid fire.

But I must not linger on the summit of Ætna. We will now take a flight thence, all across Europe, to Iceland—a wonderful land of frost and fire. It is full of volcanoes, one of which, Hecla, has been twenty-two times in eruption within the last 800 years. Besides Hecla, there are five others, from which in the same period twenty eruptions have burst forth, making about one every twenty years. The most formidable of these was that which happened in 1783, a year also memorable as that of the terrible earthquake in Calabria. In May of that year, a bluish fog was observed over the mountain called Skaptur Jokul, and the neighborhood was shaken by earthquakes.

DARKENED THE WHOLE COUNTRY.

After a while a great pillar of smoke was observed to ascend from it, which darkened the whole surrounding district, and descended in a whirlwind of ashes. On the 10th of May, innumerable fountains of fire were seen shooting up through the ice and snow which covered the mountain ; and the principal river, called the Skapta, after rolling down a flood of foul and poisonous water, disappeared.

Two days after, a torrent of lava poured down into the bed which the river had deserted. The river had run in a ravine, 600 feet deep and 200 broad. This the lava entirely filled ; and not only so, but it overflowed the surrounding country, and ran into a great lake, from which it instantly expelled the water in an explosion of steam. When the lake was fairly filled, the lava again overflowed and divided into two streams, one of which covered some

ancient lava fields; the other re-entered the bed of the Skapta lower down; and presented the astounding site of a cataract of liquid fire pouring over what was formerly the waterfall of Stapafoss.

This was the greatest eruption on record in Europe. It lasted in its violence till the end of August, and closed with a violent earthquake; but for nearly the whole year a canopy of cinder-laden cloud hung over the island; the Faroe Islands, nay, even Shetland and the Orkneys, were deluged with the ashes; and volcanic dust and a preternatural smoke, which obscured the sun, covered all Europe as far as the Alps, over which it could not rise.

GREAT DESTRUCTION OF LIFE.

It has been surmised that the great Fireball of August 18, 1783, which traversed all England, and the Continent, from the North Sea to Rome, by far the greatest ever known (for it was more than half a mile in diameter), was somehow connected with the electric excitement of the upper atmosphere produced by this enormous discharge of smoke and ashes. The destruction of life in Iceland was frightful; 9000 men, 11,000 cattle, 28,000 horses and 190,000 sheep perished: mostly by suffocation. The lava ejected has been computed to have amounted in volume to more than twenty cubic miles.

We shall now proceed to still more remote regions, and describe, in as few words as may be, two immense eruptions—one in Mexico, in the year 1759; the other in the Island of Sumbawa in the Eastern Archipelago, in 1815.

I ought to mention, by way of preliminary, that almost the whole line of coast of South and Central America, from Mexico southwards as far as Valparaiso—that is to say, nearly the whole chain of the Andes—is one mass of volcanoes. In Mexico and Central America there are two and twenty, and in Quito, Peru, and Chili, six and twenty more, in activity; and nearly as many more extinct ones, any one of which may at any moment break out afresh. This does not prevent the country from being inhabited, fertile and well cultivated.

Well: in a district of Mexico celebrated for the growth of the finest cotton, between two streams called Cuitimba and San Pedro, which furnished water for irrigation, lay the farm and homestead of Don Pedro de Jurullo, one of the richest and most fertile properties in that country. He was a thriving man and lived in comfort as a large proprietor, little expecting the mischief that was to befall him.

In June 1759, however, a subterranean noise was heard in this peaceful region. Hollow sounds of the most alarming nature were succeeded by frequent earthquakes, succeeding one another for fifty or sixty days; but they died away, and in the beginning of September everything seemed to have returned to its usual state of tranquillity. Suddenly, on the night of the 28th of September, the horrible noises recommenced. All the inhabitants fled in terror, and the whole tract of ground, from three to four square miles in extent, rose up in the form of a bladder to a height of upwards of 500 feet.

IMMENSE TORRENT OF BOILING MUD.

Flames broke forth over a surface of more than half a square league, and through a thick cloud of ashes illuminated by this ghastly light, the refugees, who had ascended a mountain at some distance, could see the ground as if softened by the heat, and swelling and sinking like an agitated sea. Vast rents opened in the earth, into which the two rivers I mentioned precipitated themselves, but so far from quenching the fires, only seemed to make them more furious. Finally, the whole plain became covered with an immense torrent of boiling mud, out of which sprang thousands of little volcanic cones called Hornitos, or ovens.

But the most astonishing part of the whole was the opening of a chasm vomiting out fire, and red-hot stones and ashes, which accumulated so as to form "a range of six large mountain masses, one of which is upwards of 1600 feet in height above the old level, and which is now known as the volcano of Jurullo. It is continually burning, and for a whole year continued to throw up

an immense quantity of ashes, lava and fragments of rock. The roofs of houses at the town or village of Queretaro, upwards of 140 miles distant, were covered with the ashes.

The two rivers have again appeared, issuing at some distance from among the hornitos, but no longer as sources of wealth and fertility, for they are scalding hot, or at least were so when Baron Humboldt visited them several years after the event. The ground even then retained a violent heat, and the hornitos were pouring forth columns of steam twenty or thirty feet high, with a rumbling noise like that of a steam boiler.

The island of Sumbawa is one of that curious line of islands which links on Australia to the southeastern corner of Asia. It forms, with one or two smaller volcanic islands, a prolongation of Java, at that time, in 1815, a British possession, and under the government of Sir Stamford Raffles, to whom we owe the account of the eruption, and who took a great deal of pains to ascertain all the particulars. Java itself, I should observe, is one rookery of volcanoes, and so are all the adjoining islands in that long crescent-shaped line I refer to.

EXTRAORDINARY ERUPTION.

On the island of Sumbawa is the volcano of Tomboro, which broke out into eruption on the 5th of April in that year, and I can hardly do better than quote the account of it in Sir Stamford Raffles' own words:

"Almost every one," says this writer, "is acquainted with the intermitting convulsions of Etna and Vesuvius as they appear in the descriptions of the poet, and the authentic accounts of the naturalist; but the most extraordinary of them can bear no comparison, in point of duration and force, with that of Mount Tomboro in the island of Sumbawa! This eruption extended perceptible evidences of its existence over the whole of the Molucca Islands, over Java, a considerable portion of the Celebes, Sumatra and Borneo, to a circumference of 1000 statute miles from its centre" (i. e., to 1000 miles distance), "by tremulous motions and the report of explosions.

"In a short time the whole mountain near the Sang'ir appeared like a body of liquid fire, extending itself in every direction. The fire and columns of flame continued to rage with unabated fury until the darkness, caused by the quantity of falling matter, obscured it about 8 P. M. Stones at this time fell very thick at Sang'ir, some of them as large as two fists, but generally not larger than walnuts. Between 9 and 10 P. M. ashes began to fall, and soon after a violent whirlwind ensued, which blew down nearly every house of Sang'ir, carrying the roofs and light parts away with it.

HUGE TREES TORN UP.

"In the port of Sang'ir, adjoining Sumbawa, its effects were much more violent, tearing up by the roots the largest trees, and carrying them into the air, together with men, horses, cattle, and whatsoever came within its influence. This will account for the immense number of floating trees seen at sea. The sea rose nearly twelve feet higher than it had ever been known to do before, and completely spoiled the only small spots of rice land in Sang'ir, sweeping away houses and everything within its reach. The whirlwind lasted about an hour. No explosions were heard until the whirlwind had ceased at about 11 P. M. From midnight till the evening of the 11th they continued without intermission; after that time their violence moderated and they were heard only at intervals; but the explosions did not cease entirely until the 15th of July.

"Of all the villages round Tomboro, Tempo, containing about forty inhabitants, is the only one remaining. In Pekaté no vestige of a house is left; twenty-six of the people, who were at Sumbawa at the time, are the whole of the population who have escaped. From the best inquiries, there were certainly not fewer than 12,000 individuals in Tomboro and Pekaté at the time of the eruption, of whom five or six survive.

"The trees and herbage of every description along the whole of the north and west of the peninsula, have been completely destroyed, with the exception of a high point of land near the spot

where the village of Tomboro stood. At Sang'ir, it is added, the famine occasioned by this event was so extreme, that one of the rajah's own daughters died of starvation.

"I have seen it computed that the quantity of ashes and lava vomited forth in this awful eruption would have formed three mountains the size of Mont Blanc, the highest of the Alps ; and if spread over the surface of Germany, would have covered the whole of it two feet deep. The ashes did actually cover the whole island of Tombock, more than one hundred miles distant, to that depth, and 44,000 persons there perished by starvation, from the total destruction of all vegetation.

LAKE OF MOLTEN LAVA.

"The mountain Kirauiah, in the island of Owyhee, one of the Sandwich Isles, exhibits the remarkable phenomenon of a lake of molten and very liquid lava always filling the bottom of the crater, and always in a state of terrific ebullition, rolling to and fro its fiery surge and flaming billows—yet with this it is content, for it would seem that at least for a long time past there has been no violent outbreak so as to make what is generally understood by a volcanic eruption.

"Volcanic eruptions are almost always preceded by earthquakes, by which the beds of rock, that overlie and keep down the struggling powers beneath, are dislocated and cracked, till at last they give way, and the strain is immediately relieved. It is chiefly when this does not happen, when the force below is sufficient to heave up and shake the earth, but not to burst open the crust, and give vent to the lava and gases, that the most destructive effects are produced.

"The great earthquake of November 1, 1755, which destroyed Lisbon, was an instance of this kind, and was one of the greatest, if not the very greatest on record; for the concussion extended over all Spain and Portugal—indeed, over all Europe, and even into Scotland—over North Africa, where in one town in Morocco 8000 or 10,000 people perished. Nay, its effects extended even across the Atlantic to Madeira, where it was very violent ; and to

the West Indies. The most striking feature about this earthquake was its extreme suddenness.

"All was going on quite as usual in Lisbon the morning of that memorable day, the weather fine and clear, and nothing whatever to give the population of that great capital the least suspicion of mischief. All at once, at twenty minutes before 10 A. M., a noise was heard like the rumbling of carriages under ground; it increased rapidly and became a succession of deafening explosions like the loudest cannon. Then a shock, which, as described by one writing from the spot, seemed to last but the tenth part of a minute, and down came tumbling palaces, churches, theatres, and every large public edifice, and about a third or a fourth part of the dwelling houses.

More shocks followed in succession, and in six minutes from the commencement 60,000 persons were crushed in the ruins! Here are the simple but expressive words of one J. Latham, who writes to his uncle in London. "I was on the river with one of my customers going to a village three miles off. Presently the boat made a noise as if on the shore or landing, though then in the middle of the water. I asked my companion if he knew what was the matter. He stared at me, and looking at Lisbon, we saw the houses falling, which made him say, 'God bless us, it is an earthquake!' About four or five minutes after, the boat made a noise as before, and we saw the houses tumble down on both sides of the river." They then landed and made for a hill, whence they beheld the sea (which had at first receded and laid a great tract dry) come rolling in, in a vast mountain wave fifty or sixty feet high, on the land, and sweeping all before it.

Three thousand people had taken refuge on a new stone quay just completed at great expense. In an instant it was turned topsy-turvy, and the whole quay, and every person on it, with all the vessels moored to it, disappeared, and not a vestige of them ever appeared again. Where that quay stood, was afterwards found a depth of 100 fathoms (600 feet) of water. It happened to be a religious festival, and most of the population were assembled in the churches, which fell and crushed them. That no horror

might be wanting, fires broke out in innumerable houses where wood-work had fallen on the fires, and much that the earthquake had spared was destroyed by fire.

"And then, too, broke forth that worst of all scourges, a lawless ruffian-like mob, who plundered, burned, and murdered in the midst of all that desolation and horror. The huge wave I have spoken of swept the whole coast of Spain and Portugal. Its swell and fall was ten or twelve feet at Madeira. It swept quite across the Atlantic, and broke on the shores of the West Indies. Every lake and firth in England and Scotland was dashed for a moment out of its bed, the water not partaking of the sudden shove given to the land, just as when you splash a flat saucerful of water, the water dashes over on the side from which the shock is given.

One of the most curious incidents in this earthquake was its effect on ships far out at sea, which would lead us to suppose that the immediate impulse was in the nature of a violent blow or thrust upward, under the bed of the ocean. Thus it is recorded that this upward shock was so sudden and violent on a ship, at that time forty leagues from Cape St. Vincent, that the sailors on deck were tossed up into the air to a height of eighteen inches.

MAINMAST SPLIT BY A BLOW.

"So also, on another occasion, in 1796, a British ship eleven miles from land near the Philippine Islands was struck upwards from below with such force as to unship and split up the mainmast.

"Evidences of a similar sudden and upward explosive action are of frequent occurrence among the extinct volcanoes of Auvergne and the Vivarais, where in many instances the perforation of the granitic beds which form the basis or substatum of the whole country appears to have been affected at a single blow, accompanied with little evidence of disturbance of the surrounding rocks—much in the same way as a bullet will pass through a pane of glass without starring or shattering it.

"In such cases it would seem as if water in a liquid state

had suddenly been let in through a fissure upon a most intensely heated and molten mass beneath, producing a violent but local explosion so instantaneous as to break its way through the overlying rocks, without allowing time for them to bend or crumple, and so displace the surrounding masses.

"The same kind of upward bounding movement took place at Riobambo in Quito in the great earthquake of February 4, 1797, which was connected with an eruption of the volcano of Tunguragua. That earthquake extended in its greatest intensity over an oval space of 120 miles from south to north, and 60 from east to west, within which space every town and village was levelled with the ground; but the total extent of surface shaken was upward of 500 miles in one direction (from Puna to Popayan), and 400 in the other. Quero, Riobamba, and several other towns, were buried under fallen mountains, and in a very few minutes 30,000 persons were destroyed. At Riobamba, however, after the earthquake, a great number of corpses were found to have been tossed across a river, and scattered over the slope of a hill on the other side.

EARTH SHAKING VIOLENTLY.

"The frequency of these South American earthquakes is not more extraordinary than the duration of the shocks. Humboldt relates than on one occasion, when traveling on mule-back with his companion Bonpland, they were obliged to dismount in a dense forest, and throw themselves on the ground; the earth being shaken uninterruptedly for upwards of a quarter of an hour with such violence that they could not keep their legs.

"One of the most circumstantially described earthquakes on record is that which happened in Calabria on the 5th of February, 1783; I should say began then, for it may be said to have lasted four years. In the year 1783, for instance, 949 shocks took place, of which 501 were great ones, and in 1784, 151 shocks were felt, ninety-eight of which were violent. The centre of action seemed to be under the towns of Monteleone and Oppido.

"In a circle twenty-two miles in radius round Oppido every town and village was destroyed within two minutes by the first

shock, and within one of seventy miles radius all were seriously shaken and much damage done. The whole of Calabria was affected, and even across the sea Messina was shaken, and a great part of Sicily.

"There is no end of the capricious and out-of-the-way accidents and movements recorded in this Calabrian earthquake. The ground undulated like a ship at sea. People became actualy sea-sick, and to give an idea of the undulation (just as it happens at sea), the scud of the clouds before the wind seemed to be fitfully arrested during the pitching movement when it took place in the same direction and to redouble its speed in the reverse movement.

HOUSES ENTOMBED.

"At Oppido many houses were swallowed up bodily. Loose objects were tossed up several yards into the air. The flagstones in some places were found after a severe shock all turned bottom upwards. Great fissures opened in the earth, and at Terra Nova a mass of rock 200 feet high and 400 feet in diameter traveled four miles down a ravine. All landmarks were removed, and the land itself, in some instances, with trees and hedges growing on it, carried bodily away and set down in another place.

"Altogether about 40,000 people perished by the earthquakes, and some 20,000 more of the epidemic diseases produced by want and the effluvia of the dead bodies.

"Volcanoes occasionally break forth at the bottom of the sea, and, when this is the case, the result is usually the production of a new island. This, in many cases, disappears soon after it's formation, being composed of loose and incoherent materials which easily yield to the destructive power of the waves. Such was the case with the Island of Sabrina, thrown up in 1811, off St. Michael's, in the Azores, which disappeared almost as soon as formed, and in that of Pantellaria, on the Sicilian coast, which resisted longer, but was gradually washed into a shoal, and at length has, we believe, completely disappeared.

"In numerous other instances, the cones of cinders and scoriæ, once raised, have become compacted and bound together

by the effusion of lava, hardening into solid stone, and thus, becoming habitual volcanic vents, they continue to increase in height and diameter, and assume the importance of permanent volcanic islands. Such has been, doubtless, the history of those numerous insular volcanoes which dot the ocean in so many parts of the world such as Teneriffe, the Azores, Ascension, St. Helena, Tristan d'Acunha, etc.

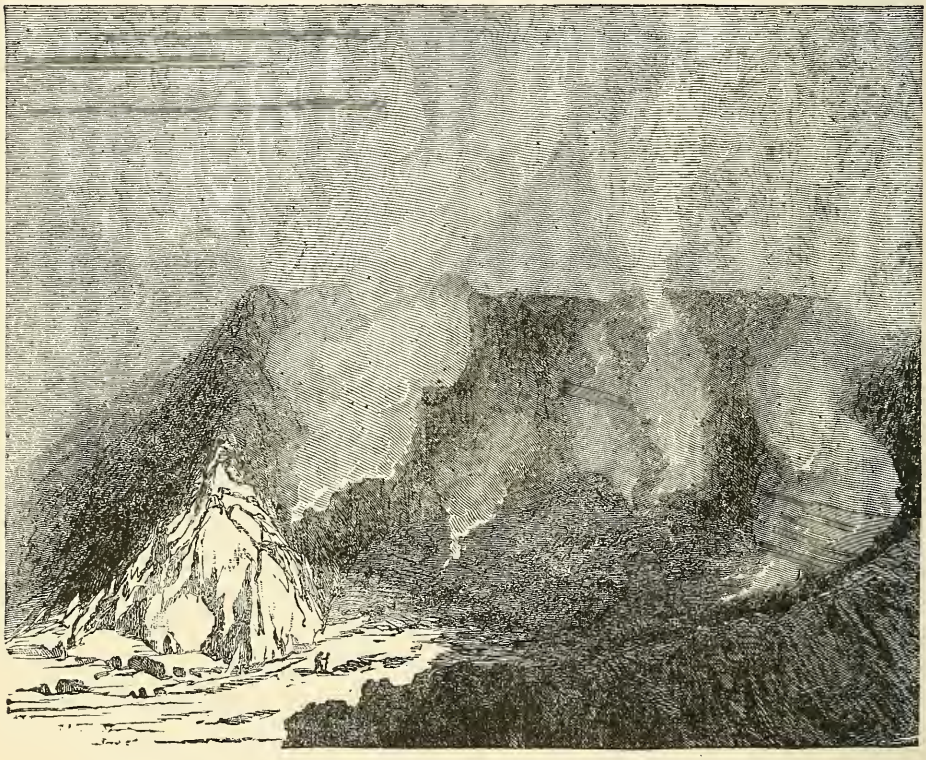
"In some cases the process has been witnessed from its commencement, as in that of two islands which arose in the Aleutian group connecting Kamschatka with North America, the one in 1796, the other in 1814, and which both attained the elevation of 3000 feet.

VOLCANIC ACTION IN OCEANS.

"Besides these evident instances of eruptive action, there is every reason to believe that enormous floods of lava have been, at various remote periods in the earth's history, poured forth at the bottom of the seas so deep as to repress, by the mere weight of water, all outbreak of steam, gas, or ashes; and reposing perhaps for ages in a liquid state, protected from the cooling action of the water on their upper surface by a thick crust of congealed stony matter, to have assumed a perfect level; and, at length, by slow cooling, taken on that peculiar columnar structure which we see produced in minature in starch by the contraction or shrinkage, and consequent splitting, of the material in drying; and resulting in those picturesque and singular landscape features called basaltic colonnades: when brought up to-day by sudden or gradual upheaval, and broken into cliffs and terraces by the action of waves, torrents, or weather. Those grand specimens of such colonnades which Britain possesses in the Giant's Causeway of Antrim, and the cave of Fingal, in Staffa, for instance, are no doubt extreme outstanding portions of such a vast submarine lava-flood which at some inconceivably remote epoch occupied the whole intermediate space; affording the same kind of evidence of a former connection of the coasts of Scotland and Ireland as do the opposing chalk cliffs of Dover and Boulogne of the ancient connection of France with Britain. Here and there a small basaltic

island, such as that of Rathlin, remains to attest this former continuity, and to recall to the contemplative mind that sublime antagonism between sudden violence and persevering effort, which the study of geology impresses in every form of repetition.

"There exists a very general impression that earthquakes are preceded and ushered in by some kind of preternatural, and,



NEAR VIEW OF A VOLCANIC CRATER IN SOUTH AMERICA.

as it were, expectant calm in the elements; as if to make the confusion and desolation they create the more impressive. The records of such visitations which we possess, however striking some particular cases may appear, by no means bear out this as a general fact, or go to indicate any particular phase of weather as preferentially accompanying their occurrence.

"This does not prevent, however, certain conjunctures of atmospheric or other circumstances from exercising a determining

influence on the times of their occurrence. According to the view we have taken of their origin (viz., the displacement of pressure, resulting in a state of strain in the strata at certain points, gradually increasing to the maximum they can bear without disruption), it is the last ounce which breaks the camel's back. Great barometrical fluctuation, accumulating atmospheric pressure for a time over the sea, and relieving it over the land; an unusually high tide, aided by the long-continued and powerful winds heaping up the water; nay, even the tidal action of the sun and moon on the solid portion of the earth's crust—all these causes, for the moment combining, may very well suffice to determine the instant of fracture, when the balance between the opposing forces is on the eve of subversion.

"The last-mentioned cause may need a few words of explanation. The action of the sun and moon, though it cannot produce a tide in the solid crust of the earth, tends to do so, and, were it fluid, would produce it. It, therefore, in point of fact, does bring the solid portions of the earth's surface into a state alternately of strain and compression.

"The effective part of their force, in the present case, is not that which aids to lift or to press the superficial matter (for that acting alike on the continents and on the bed of the sea, would have no influence), but that which tends to produce lateral displacement; or what geometers call the tangential force. This of necessity brings the whole ring of the earth's surface, which at any instant has the acting luminary on its horizon, into a state of strain; and the whole area over which it is nearly vertical, into one of compression. We leave this point to be further followed out, but we cannot forbear remarking, that the great volcanic chains of the world have, in point of fact, a direction which this cause of disruption would tend rather to favor than to contravene.

CHAPTER XX.

ERUPTION OF ETNA IN THE YEAR 1865.—MUTUAL DEPENDENCE OF ALL TERRESTRIAL PHENOMENA.—SEA COAST LINE OF VOLCANOES.—THE PACIFIC "CIRCLE OF FIRE."

THE Greek mythology, harmonizing in this respect with the ideas of most nations which were acquainted with volcanoes, attributed to these mountains an origin altogether independent of the forces which are in action on the surface of the ground. According to the views of the Hellenes, water and fire were two distinct elements, and each had its separate domain, its genii, and its gods. Neptune reigned over the sea; it was he that unchained the storms and caused the waves to swell. The tritons followed in his train; the nymphs, sirens, and marine monsters obeyed his orders, and in the mountain valleys, the solitary naiads poured out to his honor the murmuring water from their urns. In the dark depth of unknown abysses was enthroned the gloomy Pluto; at his side Vulcan; surrounded by Cyclops, forged thunderbolts at his resounding anvil, and from their furnaces escaped all the flames and molten matter the appearance of which so appalled mankind. Between the gods of water and of fire there was nothing in common, except that both were the sons of Chronos, that is, of Time, which modifies every thing, which destroys and renews, and, by its incessant work of destruction, makes ready a place for the innumerable germs of vitality which crowd on the threshold of life.

Even in our days, the common opinion is not much at variance with these mythological ideas, and volcanic phenomena are looked upon as events of a character altogether different from other facts of terrestrial vitality. The latter, the sudden changes of which are visible and easily to be observed, are justly considered to be owing principally to the position of the earth in respect to the sun and the alternations of light and darkness, heat and cold, dryness and moisture, which necessarily result.

As regards volcanoes, on the contrary, an order of entirely distinct facts is imagined, caused by the gradual cooling of the planet or the unequal tides of an ocean of lava and fire. Certainly, the eruptions of ashes and incandescent matter have not revealed the mystery of their formation, and in this respect numerous problems still remain unsolved by scientific men. Nevertheless, the facts already known warrant us in asserting that volcanic crises are connected, like all other planetary phenomena, with the general causes which determine the continual changes of continents and seas, the erosion of mountains, the courses of rivers, winds, and storms, the movements of the ocean, and all the innumerable modifications which are taking place on the globe.

ORIGIN OF VOLCANOES.

If, some day, we are to succeed in pointing out exactly and plainly how volcanoes likewise obey, either partially or completely, the system of laws which govern the exterior of the globe, the first and most important requisite is to observe with the greatest care all the incidents of volcanic origin. When all the premonitory signs and all the products of eruptions shall have been perfectly ascertained and duly classified, then the glance of science will be on the point of penetrating into, and duly reading, the secrets of the subterranean abysses where these marvelous convulsions are being prepared.

The last great eruption of Etna, that central pyramid of the Mediterranean, which the ancients named the "Umbilicus of the world," is one of the most magnificent examples which can be brought forward of volcanic phenomena; and as it has, moreover, been studied most precisely and completely, it well deserves to be described in some detail.

The explosion had been heralded for some long time by precursory signs. In the month of July, 1863, after a series of convulsive movements of the soil, the loftiest cone of the volcano opened on the side which faces the south. The incandescent matter descended slowly over the plateau on which stands the "Maison des Anglais:" and this building itself was demolished

by the lumps of lava which were hurled from the mouth of the crater. In some places heaps of ashes several yards thick covered the slopes of the volcano.

After this first explosion, the mountain never became completely calm ; numerous fissures, which opened on the outer slopes of the crater, continued to smoke, and the hot vapor never ceased to jet out from the summit in thick eddies. Often, indeed, during the night, the reflection of the lava boiling up in the central cavity lighted up the atmosphere with a fiery red. The liquid, being unable to rise to the mouth of the crater, pressed against the external walls of the volcano, and sought to find an issue through the weakest point of the crust by melting gradually the rocks that opposed its passage.

GROUND RENT ASUNDER.

Finally, in the night of the 30th to the 31st of January, 1865, the wall of the crater yielded to the pressure of the lava; some subterranean roaring was heard; slight agitations affected the whole of the eastern part of Sicily, and the ground was rent open for the length of a mile and a half to the north of Monte Frumento, one of the secondary cones which rise on the slope of Etna. Through this fissure, which opened on a gently-inclined plateau, the pent-up lava violently broke through to the surface.

The fissure which opened on the side of the mountain, and could be easily followed by the eye to a point about two-thirds of the height of Monte Frumento, in the direction of the terminal crater of Etna, seems to have vomited out lava but for a very few hours. Being soon obstructed by the snow and debris of the adjacent slopes, it ceased to retain its communication with the interior of the mountain, and now resembled a kind of furrow, as if hollowed out by the rain-water on the side of the cone. On the 31st of January all the volcanic activity of the crevice was concentrated on the gently inclined plateau which extends at the base of Monte Frumento, in the midst of which several new hillocks made their appearance.

On the lower prolongation of the line of fracture, all the

phenomena of the eruption properly so-called were distributed in a perfectly regular way. Six principal cones of ejection were raised above the crevice, and gradually increased in size, owing to the debris which they threw out of their craters. These, gradually mingling their intervening slopes, and blending them one with another, absorbed in succession other smaller cones which had been formed by their sides, thus reaching a height of nearly 300 feet. Soon after the commencement of the eruption the two upper craters, standing close together on an isolated cone, vomited nothing but lumps of stone and ashes, while jets of still liquid lava were emitted by the lower craters, which were arranged in a semi-circle around a sort of funnel-shaped cavity.

HOW LAVA MADE ITS ESCAPE.

In consequence of the specific gravities of the substances evacuated, a regular division of labor took place between the various points of the crevice. The projectiles which had solidified the triturated debris, and the more or less porous fragments which floated on the top of the lava, made their escape by the higher orifices ; but the liquid mass, being heavier and more compact, could only burst forth from the ground by the mouths opening at a less elevation.

Two months after the commencement of the eruption, the cone which was the nearest to Frumento ceased to send out either scoriæ or ashes. The pipe of the crater was filled up with debris, and the internal activity was revealed by vapors either of a sulphurous character or charged with hydrochloric acid. These rose like smoke from the slope of the hillock. The second cone, situated on a lower part of the fissure, remained in direct communication with the central flow of lava ; but it was not in a constant state of eruption, and rested after each effort as if to take breath. A crash like that of thunder was the forerunner of the explosion ; clouds of vapor, rolling in thick folds, gray with ashes and furrowed with stones, darted out from the mouth of the volcano, darkening the atmosphere and throwing their projectiles over a radius of several hundreds of yards round the hillock.

Then, after having discharged their burdens of debris, the dark clouds, giving way to the pressure of the winds, mingled far and wide with the mists of the horizon. The lower cones, which rose immediately over the lava-source, continued to rumble and discharge molten matter outside their cavities. The vapor which escaped from the seething wall of lava crowded in dark contortions round the orifice of the craters. Some of it was red or yellow, owing to the reflection of the red-hot matter, and some was variously shaded by the trains of debris ejected with it; but it was impossible to follow them with the eye so rapid was their flight. An unintelligible tumult of harsh sounds simultaneously burst forth. They were like the noises of saws, whistles, and of hammers falling on an anvil. Sometimes one might have fancied it like the roaring of the waves breaking upon the rocks during a storm, if the sudden explosions had not added their thunder to all this uproar of the elements.

HILLS ROARING AND SMOKING.

One felt dismayed, as if before some living being, at the sight of these groups of hillocks, roaring and smoking, and increasing in size every hour, by the debris which they vomited forth from the interior of the earth. The volcano, however, then commenced to rest; the erupted matter did not rise much beyond 100 yards above the craters, while, according to the statement of M. Fouqué, at the commencement of the eruption it had been thrown to a height of 1850 to 1950 yards.

During the first six days the quantity of lava which issued from the fissure of Monte Frumento was estimated at 117 cubic yards a second, equivalent to a volume twice the bulk of the Seine at low-water time. In the vicinity of the outlets the speed of the current was not less than twenty feet a minute; but lower down, the stream, spreading over a wider surface, and throwing out several branches into the side valleys, gradually lost its initial speed, and the fringes of scoriæ, which were pushed on before the incandescent matter, advanced, on the average, according to the slope of the ground, not more than one and a half to six feet a minute.

On the second of February the principal current, the breadth of which varied from 300 to 550 yards, with an average thickness of forty-nine feet, reached the upper ledge of the escarpment of Colla-Vecchia, or Colla-Grande, three miles from the fissure of eruption, and plunged like a cataract into the gorge below. It was a magnificent spectacle, especially during the night, to see this sheet of molten matter, dazzling red like liquid iron, making its way, in a thin layer, from the heaps of brown scoriæ which had gradually accumulated up above; then, carrying with it the more solid lumps, which dashed one against the other with a metallic noise, it fell over into the ravine, only to rebound in stars of fire.

ITS BEAUTY FINALLY FADED.

But this splendid spectacle lasted only for a few days; the fiery fall, by losing in height, diminished gradually in beauty. In front of the cataract, and under the jet itself, there was formed an incessantly increasing slope of lava, which ultimately filled up the ravine, and, indeed, prolonged the slope of the valley above. From the reservoir, which was more than 160 feet deep, the stream continued to flow to the east toward Mascali, filling up to the brink the winding gorge of a dried up rivulet.

By the middle of the month of February, the fiery stream, already more than six miles long, made but very slow progress, and the still liquid lava found it difficult to clear an outlet through the crust of stones cooled by their contact with the atmosphere; when, all of a sudden, a breaking out took place at the side of the stream, at a point some distance up, not far from the source. Then a fresh branch of the burning river, flowing toward the plains of Linguagrossa, swallowed up thousands of trees which had been felled by the woodman.

This second inundation of lava did not, however, last long. The villages and towns situated at the base of the mountain were no longer directly menaced; but the disasters caused by the eruption were, notwithstanding, very considerable. A number of farm-houses were swept away; vast tracts of pasturage and cultivated ground were covered by slowly hardening rock, and—a

misfortune which was all the worse on account of the almost general deforesting of Sicily—a wide band of forest, comprising, according to the various estimates that were made, from 100,000 to 130,000 trees—oaks, pines, chestnuts, or birches—was completely destroyed.

When seen from the lower part of the mountain, all these burning trunks borne along upon the lava, as if upon a river of fire, singularly contributed to the beauty of the spectacle. As is always the case in the events of this world, the misfortune of some proved to be a source of gratification to others. During the earliest period of the eruption, while the villagers of Etna looked at it with stupor, and were bitterly lamenting over the destruction of their forests, hundreds of curious spectators, brought daily by the steamboats from Catania and Messina, came to enjoy at their ease the contemplation of all the splendid horrors of the conflagration.

PYRAMIDS AND TWISTED COLUMNS.

The aspect of the current of lava, as it appeared covered with its envelope of scoriæ, was scarcely less remarkable than the sight of the matter in motion. The black or reddish aspect of the cheire was all roughened with sharp-edged projections, which resembled steps, pyramids or twisted columns, on which it was a difficult matter to venture, except at the risk of tearing the feet and hands. Some months after the commencement of the eruption, the onward motion of the interior of the molten stone, which, by breaking the outer crust in every direction, had ultimately given it this rugged outline, was still visibly taking place. Here and there cracks in the rock allowed a view, as if through an air-hole, of the red and liquid lava swelling up as it flowed gently along like some viscous matter.

A metallic clinking sound was incessantly heard, proceeding from the fall of the scoriæ, which were breaking under the pressure of the liquid matter. Sometimes, on the hardening current of lava, a kind of blister gradually rose, which either opened gently, or bursting with a crash gave vent to the molten mass which formed it. Fumerolles, composed of various gases, according to the degree of heat of the lava which gave rise to them, jetted

out from all the issues. Even on the banks of the river of stone the soil was in many places all burning and pierced with crevices, through which escaped a hot air thoroughly charged with the smell of burnt roots.

On the slopes of Frumento, quite close to the upper part of the fissure, at a spot where the liquid mass had flowed like a torrent, M. Fouqué noticed a remarkable phenomenon; sheaths of solidified lava were surrounding the trunks of pines, and thus showing the height to which the current of molten stone had reached.

In like manner, the streams of obsidian which flow rapidly from the basin of Kilauea, in the isle of Hawaii, leave behind them on the branches of the trees numerous stalactites like the icicles which are formed by melting snow which has again frozen. Below the escarpments of the Frumento, the torrent, which was there retarded in its progress, had not contented itself with bathing for a moment the trunks of the forest trees, but had laid them low. Great trunks of trees, broken down by the lava, lay stretched in disorder on the uneven bed of the stream, and, although they were only separated from the molten matter by a crust a few inches thick, numbers of them were still clothed with their bark; several had even preserved their branches.

PINE TREES AND FIRS.

At the edge of the cheire, some pine trees, which had perhaps been preserved from the fire by the moisture being converted by the heat into a kind of coating of steam, were surrounded by a wall of heaped up lava, and their foliage still continued green; it could not yet be ascertained if the sources of the sap had perished in their roots.

In some places, rows of firs very close together were sufficient to change the direction of the flow, and to cause a lateral deviation. Not far from the crater of eruption, on the western bank of the great cheire, a trunk of a tree was noticed which by istelf had been able to keep back a branch of the stream, and to prevent it from filling up the glen which opened immediately below.

This tree, being thrown down by the weight of the scoriæ, had

fallen so as to bar up a slight depression in the ground which presented a natural bed to the molten matter. The latter had bent and cracked the trunk, but had failed in breaking it, and the stony torrent had remained suspended, so to speak, above the beautiful wooden slopes which it threatened to destroy completely.

Round the very mouth of the volcano, a vast glade was formed in the forest; the ground was covered everywhere with ashes which the wind had blown into hillocks, like the dunes on the sea coast; all the trees had been broken down by the volcanic projectiles, and burned by the scoriæ and small stones. The nearest trees that were met with, at unequal distances from the mouths of eruption, had had their branches torn off by the falling lumps of stone, or were buried in ashes up to their terminal crown.

SEVENTY-FIVE RECORDED ERUPTIONS.

A spectator might have walked among a number of yellow branches which were once the tops of lofty pines. Thus, on the plateau of Frumento and the lower slopes, everything was changed both in form and aspect; we might justly say that, by the effects of the erupted matter, the outline of the sides of Etna itself had been perceptibly modified.

And yet this last eruption, one of the most important in our epoch, is but an insignificant episode in the history of the mountain; it was but a mere pulsation of Etna. During the last twenty centuries only, more than seventy-five eruptions have taken place, and in some of them the flows of lava have been more than twelve miles in length, and have covered areas of more than forty square miles, which were once in a perfect state of cultivation, and dotted over with towns and villages. In former ages, thousands of other lava-flows and cones of ashes have gradually raised and lengthened the slopes of the mountain.

The mass of Mount Etna, the total bulk of which is three or four thousand times greater than the most considerable of the rivers of stone vomited from its bosom, is, in fact, from its summit to its base, down even to the lowest submarine depths, nothing but the product of successive eruptions throwing out the molten

matter of the interior. The volcano itself has slowly raised the walls of its crater, and then extended its long slopes down to the waters of the Ionian Sea. By its fresh beds of lava and scoriæ incessantly renewed one upon the other, it has ultimately reared its summit into the regions of snow, and has become, as Pindar called it, the great "pillar of heaven."

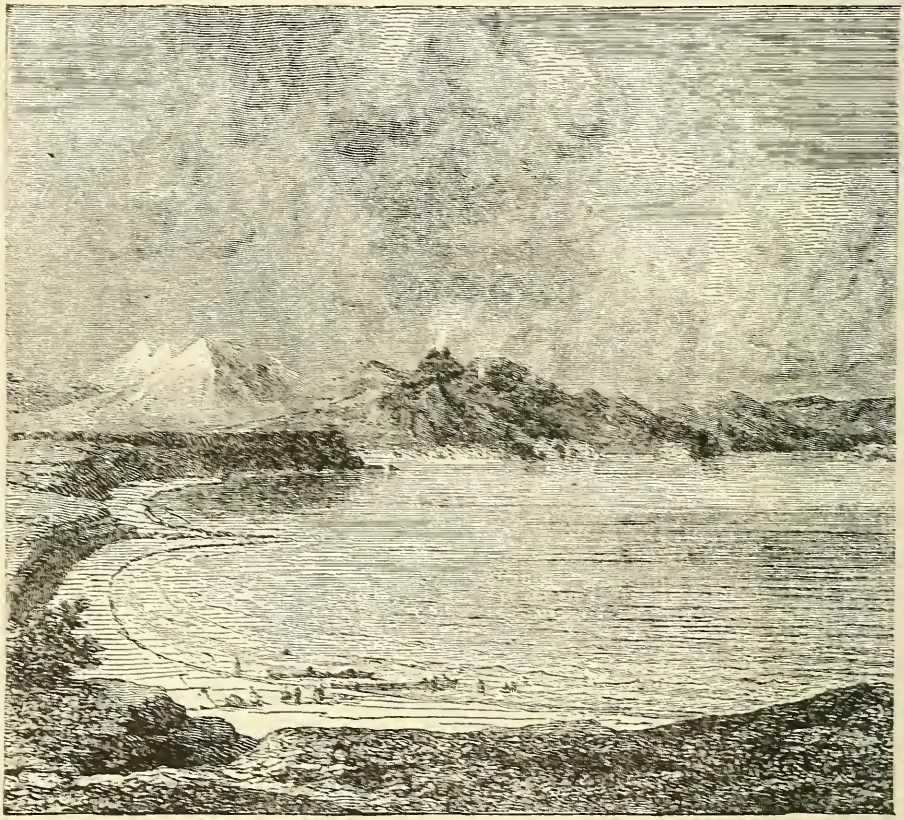
The earth being generally looked upon as immobility itself, it is a very strange thing to see it open to shoot out into the air torrents of gas, and shedding forth like a river the molten rocks of its interior. From what invisible source do all these fluid matters proceed which spread out in sheets over vast regions? Whence come those enormous bodies of steam, extensive enough to gather immediately in clouds around the loftiest summits, and sometimes indeed to fall in actual rain-showers? Science, as we have already said, has not completely answered these questions, the positive solution of which would be so highly important for our knowledge of the globe on which we live.

AN OLD POPULAR SUPERSTITION.

According to an ancient popular belief, Etna merely vomits forth, in the shape of vapor, the water which the sea has poured into the gulf of Charybdis. This legend, although clothed in a poetic garb, has in fact become the hypothesis which is thought beyond dispute by those savants who look upon volcanic eruptions as being a series of phenomena caused chiefly by water converted into steam.

The remarkable fact that all volcanoes are arranged in a kind of line along the coasts of the sea, or of inland lacustrine basins, is one of the great points which testify in favor of this opinion as to the infiltration of water, and give to it a high degree of probability. The Pacific, which is the principal reservoir of the water of our earth, is circled round by a series of volcanic mountains, some ranged in chains, and others very distant from one another, but still maintaining an evident mutual connection, constituting a "circle of fire," the total development of which is about 22,000 miles in length.

This ring of volcanoes does not exactly coincide with the semicircle formed by the coasts of Australia, the Sunda Islands, the Asiatic continent, and the western coasts of the New World. Like a crater described within some ancient and more extensive outlet of eruption, the great circle of igneous mountains extends



PICTURESQUE VIEW OF LAKE TAUPO AND VOLCANIC MOUNTAINS.

its immense curve in a westward direction across the waves of the Pacific, from New Zealand to the peninsula of Alaska; on the east, it is based on the coast of America, rising in the south so as to form some of the loftiest summits of the Andes.

The still smoking volcanoes of New Zealand, Tongariro and the cone of Whakari, on White Island, are, in the midst of the southern waters of the Pacific properly so called, the first evidence

of volcanic activity. On the north, a considerable space extends in which no volcanoes have yet been observed. The group of the Feejee Islands, at which the volcanic ring recommences, presents a large number of former craters which still manifest the internal action of the lava by the abundance of thermal springs. At this point, a branch crossing the South Sea in an oblique direction from the basaltic islands of Juan Fernandez as far as the active volcanoes of the Friendly group, unites itself with the principal chain which passes round, in a northeast direction, the coast of Australia and New Guinea.

GREAT FOCUS OF LAVA STREAMS.

The volcanoes of Abrim and Tanna, in the New Hebrides, Tinahoro, in the archipelago of Santa Cruz, and Semoya, in the Salomon Isles, succeeding one after the other, connect the knot of the Feejees to the region of the Sunda Islands, where the earth is so often agitated by violent shocks. This region may be considered as the great focus of the lava streams of our planet. On the kind of broken isthmus which connects Australia with the Indo-Chinese peninsula, and separates the Pacific Ocean from the great Indian seas, one hundred and nine volcanoes are vomiting out lava, ashes, or mud in full activity, destroying from time to time the towns and the villages which lie upon their slopes; sometimes, in their more terrible explosions, they ultimately explode bodily, covering with the dust of their fragments areas of several thousands of miles in extent.

From Papua to Sumatra, every large island, including probably the almost unknown tracts of Borneo, is pierced with one or more volcanic outlets. There are Timor, Flores, Sumbawa, Lombok, Bali, and Java, which last has no less than forty-five volcanoes, twenty-eight of which are in a state of activity, and, lastly, the beautiful island of Sumatra. Then, to the east of Borneo—Ceram, Amboyna, Gilolo, the volcano of Ternata, sung by Camoens, Celebes, Mindanao, Mindoro, and Luzon; these form across the sea, as it were, two great tracks of fire.

Northward of Luzon, the volcanic ring curves gradually so as

to follow a direction parallel to the coast of Asia. Formosa, the Liou-Kieou archipelago, and other groups of islands stand in a line over the submarine volcanic fissure; farther on, there are the numerous volcanoes of Japan, one of which, Fusiyama, with a cone of admirable regularity, is looked upon by the inhabitants of Niphon as a sacred mountain, from which the gods come down. The elongated archipelago of the Kuriles, comprising about a dozen volcanic orifices, unites Japan to the peninsula of Kamschatka, in which no less than fourteen volcanoes are reckoned as being in full activity.

To the east of this peninsula, the range of craters suddenly changes its direction, and describes a graceful semicircle across the Pacific, from Behring Island to the point of Alaska. Thirty-four smoking cones stand on this great transversal dike, extending from continent to continent. Ounimak, which rises on the extremity of the peninsula of Alaska, the peak of which is 7939 feet in height, serves as the western limit of the New World, and is also pierced by a crater in a state of full activity.

VOLCANO IN ALASKA.

Eastward of the peninsula, the volcanic chain extends along the seacost of the continent. Mount St. Elias, one of the highest summits in America, often vomits lava from its crater, which opens at an elevation of 17,716 feet. Farther to the south, another active volcano, Mount Fairweather, rises to a height of 14,370 feet. Next comes Mount Edgecumbe, in Lazarus Island, and the volcanic region of British Columbia. The whole chain of the Cascades, in Oregon, as well as the parallel ranges of the Sierra Nevada and the Rocky Mountains, are overlooked by a great number of volcanoes; but only a few of them continue to throw out smoke and ashes: these are Mount Baker, Renier, and St. Helens, enormous peaks 10,000 to 16,000 feet high.

In California and Northern Mexico, it is probable that the basaltic and trachtic mountains on the coast no longer present outlets of eruption. Subterranean activity is not manifested with any degree of violence until we reach the high plateaux of Central

Mexico. There a series of volcanoes, rising over a fissure crossing the continent, extends over the whole plateau of Anahuac, from the Southern Ocean to the Gulf of Mexico. The Colima, then the celebrated Jorullo, which made its appearance in 1759, the Nevado de Tolima, Istacihuetl, Popocatepetl, Orizaba, and Tuxtla are the vents for the furnace of lava which is boiling beneath the Mexican plateau.

To the south, in Gautemala and the South American republics, thirty burning mountains, much more active and terrible than those of Anahuac, rise in two chains, one of which is parallel to the sea-coast, and the other crosses obliquely the isthmus of Nicaragua. Among these numerous volcanoes there are some, the names of which have become famous on account of the frightful disasters which have been caused by their eruptions. Such are the mountains del Fuego and del Agua, above the Ciudad-Antigua of Gautemala; the Phare d'Isalco, which during the night lights up far and wide the plains of Salvador with its jets of molten stone and its column of red smoke; Coseguina, the last great eruption of which was probably the most formidable of modern times; the Viejo, Nuevo, Momotombo, and other mountains, which are almost worshiped from being so much dreaded.

ON THE PACIFIC COAST.

The depressions of the isthmuses of Panama and Darien interrupt the series of volcanoes which border on the coast of the Pacific. The peak of Tolima, which rises to the great height of 17,716 feet, is the most northern of the active volcanoes of South America, and is also one of the most distant from the sea among all the fire-vomiting mountains, for the distance from its base to the Pacific coast is not less than 124 miles. South of Tolima, and the great plateau of Pasto, where there likewise exists a crater, stands the magnificent group of sixteen volcanoes, some already extinct and some still smoking, over which towers the proud dome of Chimborazo.

Occupying an elliptical space, the great axis of which is only about 112 miles long, this group, comprising the Tunguagua,

Carahuizo, Cotopaxi, Antisana, Pichincha, Imbabura, and Sangay, is often looked upon as but one volcano with several eruptions; it is the cluster which, on the southern coasts of the Isthmus of Panama, corresponds symmetrically to the volcanic group of Anahuac. South of Sangay, which is perhaps the most destructive volcano on the earth, the chain of the Cordelleras offers no volcanoes for a length of about 930 miles; but in Southern Peru the volcanic series recommences, and outlets of eruption still in action open at intervals among extinct volcanoes and domes of trachyte.

The three smoking peaks of the inhabited part of Chili, the mountains of Antuco, Villarica, and Osono, terminate the series of the great American volcanoes; the activity of subterranean action is, however, disclosed by some other less elevated craters down to the extremity of the continent as far as the point of Terra-del-Fuego. This is not all; the South Shetland Islands, situated in the Southern Ocean, in a line with the New World, are likewise volcanic in their character; and if the same direction be followed toward the polar regions, the line will ultimately touch upon the coasts of the land of Victoria, on which rise the two lofty volcanoes of Erebus and Mount Terror, discovered by Sir John Ross.

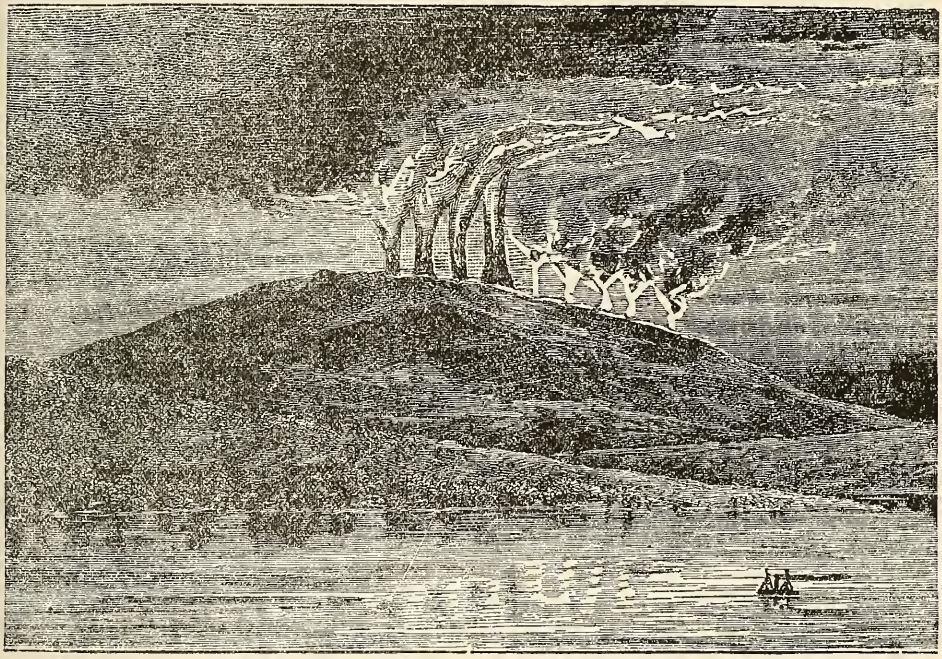
VOLCANIC CIRCLE ROUND THE EARTH.

Stretching round the sphere of the earth, the great volcanic circle is extended toward the north by various islets of the antartic, and ultimately rejoins the archipelago of New Zealand. Thus is completed the great ring of fire which circles round the whole surface of the Pacific Ocean.

Within this ampitheatre of volcanoes a multitude of those charming isles, which are scattered in pleiads over the ocean, are also of volcanic origin, and many of them can be distinguished from afar by their smoking or flaming craters. Of this kind are some of the Marianne and Gallapagos Islands, which contain several orifices in full activity, and more than two thousand cones in a state of repose. Among these we must especially mention the Sandwich Islands, the lofty volcanoes of which rise in the

middle central basin of the North Pacific like so many cones of eruption in the midst of a former crater changed into a lake.

The Mauna-Loa and Mauna-Kea, the two volcanic summits of the island of Hawaii, are each more than 13,000 feet in height; and the eruptions of the first cone, which are still in full activity, must be reckoned among the most magnificent spectacles of this kind. On the sides of the Mauna-Loa opens the boiling crater of



VOLCANO OF TONGARRIRO, NEW ZEALAND.

Kilauea, which is, without doubt, the most remarkable lava-source which exists on our planet.

Round the circumference of the Indian Ocean the border of volcanoes is much less distinct than round the Pacific; still it is possible to recognize some of its elements. To the north of Java and Sumatra, the volcanoes of which overlook the eastern portion of the basins of the Indian seas, stretches the volcanic archipelago of the Andaman and Nicobar Islands, in which there are several cones of eruption in full activity. On the west of Hindostan, the

peninsula of Kutch, and the delta of the Indus, are often agitated by subterranean forces.

Many mountains on the Arabian coast are nothing but masses of lava; and, if various travelers are to be believed, the volcanic furnace of these countries is not yet extinct. The Kenia, the great mountain of Eastern Africa, has on its own summit a crater still in action—perhaps the only one which exists on this continent. Lastly, a large number of islands which surround the Indian Ocean on the west and on the south—Socotora, Mauritius, Reunion, St. Paul, and Amsterdam Islands—are nothing but cones of eruption, which have gradually emerged from the bed of the ocean.

The volcanic districts which are scattered on the edge of the Atlantic are likewise distributed with a kind of symmetry round three sides of this great basin. On the north, Jan Mayen, so often wrapt in mist, and the more considerable island of Iceland, pierced by numerous craters, Hecla, the Skapta-Jokul, the Kotlugaja, and seventeen other mountains of eruption, separate the Atlantic from the Polar Ocean. At about 1500 miles nearer the equator the peaks of the Azores, some extinct and some still burning, rise out of the sea.

DEAD VOLCANOES.

The archipelago of the Canaries, over which towers the lofty mass of the peak of Teyda, continues toward the south the volcanic line of the Azores, and is itself prolonged by the smoking summits of the Cape de Verde Islands. All the other mountains of lava which spring up from the bed of the Atlantic more to the south appear to have completely lost their activity, and on the coast itself there is, according to Burton, only one volcano still in action—that of the Cameroons. With regard to the "line of fire" along the western Atlantic, it is developed at the entrance of the Caribbean Sea with perfect regularity, like the range of the Aleutian Isles. Trinidad, Grenada, St. Vincent, St. Lucia, Dominica, Gaudeloupe, Montserrat, Nevis, St. Kitts, and St. Eustatius are so many outlets of volcanic force, either through their

smoking craters or their mud volcanoes, their solfataras or their thermal springs.

North and south of the Antilles, the eastern coast of America does not present a single vent of eruption. It is a remarkable fact that the two volcanic groups of the Antilles and the Sunda Islands are situated exactly at the antipodes one of the other, and also in the vicinity of the two poles of flattening, the existence of which on the surface of the globe has been proved by the recent calculations of astronomers. More than this, these two great volcanic centres, which are undoubtedly the most active on the whole earth, flank, one on the west and the other on the east, the immense curve of volcanoes which spreads round the Pacific.

HIGH SUMMITS ON FIRE.

The Mediterranean is not surrounded by a circle of volcanoes; but there, as elsewhere, it is from the midst of the sea, or immediately on the sea-coast, that the burning mountains rise—Etna, Vesuvius, Stromboli, Volcano, Epomeo and Santorin. In like manner, the volcanoes of mud and gas of the peninsula of Apcheron, and the summit of Demavend, 14,436 feet high, rise at no great distance from the Caspian Sea.

With regard to the volcanoes of Mongolia—the Turfan, which is said to be still in action, and the Pe-chan, which, according to Chinese authors, vomited forth, up to the seventh century, "fire, smoke, and molten stone, which hardened as it cooled"—their existence is not yet absolutely proved; but even if these mountains, situated in the centre of the continent, should be in full activity, their phenomena might depend on the vicinity of extensive sheets of water, for this very region of Asia still possesses a large number of lakes, the remnants of a former inland sea, almost as vast as the Mediterranean.

What is the number of volcanoes which are still vomiting forth lava during the present period of the earth's vitality? It is difficult to ascertain, for often mountains have seemed for a long time to be extinct; forests have grown up in their disused craters, and their beds of lava have been covered up under a rich carpet of

vegetation, when suddenly the sleeping force beneath is aroused and some fresh volcanic outlet is opened through the ground.

When Vesuvius woke up from its protracted slumber to swallow up Pompeii and the other towns lying round its base, it had rested for some centuries, and the Romans looked upon it as nothing but a lifeless mountain like the peaks of the Apennines. On the other hand, it is very possible that some craters, from which steam and jets of gas are still escaping, or which have thrown out lava during the historic era, have entered decisively into a period of repose, ceasing somehow to maintain their communication with the subterranean centre of molten matter. The number of vents which serve for the eruption of lava can, therefore, be ascertained in a merely approximate way.

Humboldt enumerates 223 active volcanoes; Keith Johnston arrives at the larger number of 270, 190 of which are comprehended in the islands and the Pacific "circle of fire;" but this latter estimate is probably too small. To the number of these burning mountains, standing nearly all of them on the sea-shore, or in the vicinity of some great fresh water basin, must be added the salses, or mud-volcanoes, which are also found near large sheets of salt water. With regard to the thousands of extinct volcanoes which rise in various parts of the interior of the continent, geology shows that the sea used formerly to extend round their bases.

CHAPTER XXI.

TORRENTS OF STEAM ESCAPING FROM CRATERS.—GASES PRODUCED BY THE DECOMPOSITION OF SEA-WATER.—HYPOTHESES AS TO THE ORIGIN OF ERUPTION.—GROWTH OF VOLCANOES.

ONE of the most decisive arguments which can be used in favor of a free communication existing between marine basins and volcanic centres is drawn from the large quantities of steam which escape from craters during an eruption, and compose, according to M. Ch. Sainte-Claire Deville, at least 999 thousandths of the supposed volcanic smoke. During the eruption of Etna, in 1865, M. Fouqué attempted to gauge approximately the volume of water which made its escape in a gaseous form from the craters of eruption.

By taking as his scale of comparison the cone which appeared to him to emit an average quantity of steam, he found this mass, reduced to a liquid state, would be equivalent to about 79 cubic yards of water for each general explosion. Now, as these explosions took place on the average every four minutes during a hundred days, he arrived at the result, that the discharge of water during the continuance of the phenomenon might be estimated at 2,829,600 cubic yards of water—a flow equal to that of a permanent stream discharging fifty-five gallons a second. Added to this, account ought to have been taken of the enormous convolutions of vapor which were constantly issuing from the great terminal crater at Etna, and, bending over under the pressure of the wind, spread out in an immense arch around the vault of the sky.

In great volcanic eruptions it often happens that these clouds of steam, becoming suddenly condensed in the higher layers of the atmosphere, fall in heavy showers of rain, and form temporary torrents on the mountain-side. According to the statements of Sir James Ross, the mountain Erebus, of the antarctic land, is

covered with snow, which it has just vomited forth in the form of vapor. It has besides been remarked that the vapor which issues from volcanoes is not always warm; often, according to Pœppig, it is of the same temperature as the surrounding air.

As was said long since by Krug von Nidda, a German savant, volcanoes must be looked upon as enormous intermittent springs. The basaltic flows may be compared to streams on account of the water which they contain. It is probable that most of the lava which flows from volcanic fissures owes its mobility to the innumerable particles of vapor which fill up all the interstices of moving mass. Being composed in great measure of crystals already formed in the body of which may be noticed nodules and crystals rounded by friction, the lava would be unable to descend over the slopes if it were not rendered fluid by its mixture with steam; and the gradual slacking in speed and ultimate stoppage of the flow are chiefly caused by the setting free of the gases which served as a vehicle to the solid matter. Owing to this rapid loss of their humidity, basalts contain in their pores but a very slight quantity of water in comparison with other rocks. Yet even old lava themselves contain as much as ten to nineteen thousandths of water at the edge of the bed, and five to eighteen thousandths at the centre.

SEA-WATER DECOMPOSED.

The various substances which are produced from craters also tend to show that sea-water has been decomposed in the great labaratory of lava. Ordinary salt or chloride of sodium, which is the mineral that is most abundant in sea-water, is also that which is deposited the first and most plentifully round the orifices of eruption. Sometimes, the scoriæ and ashes are covered for a vast space with a white efflorescence, which is nothing but common salt; one might fancy it a shingly beach which had just been left by the ebbing tide. After each eruption of Hecla, the Icelanders are in the habit, it is said, of collecting salt on the slopes. The lava from the eruption of Frumento, analyzed by M. Fouqué, contained about thirteen ten thousandths of marine salt.

Almost all other component parts of sea-water are likewise found in the gases and deposits of fumerolles; only the salts of magnesia have disappeared, but still are found under another form among the volcanic products. Being decomposed by the high temperature, just as they would be in the laboratory of a chemist, they go to constitute other bodies. Thus the chloride of magnesium is changed into hydrochloric acid and magnesia; the gas escapes in abundance from the fumerolles, while the magnesia remains fixed in the lava.

FOUR PERIODS IN EVERY ERUPTION.

As M. Ch. Sainte-Claire Deville was the first to ascertain with certainty, four successive periods may be observed in every eruption, each of which periods assumes a different character, owing to the exhalation of certain substances. After the first period, remarkable especially for marine salt and the various compounds of soda and potash, comes a second in which the temperature is lower, and during which brilliantly colored deposits of chloride of iron are formed and hydrochloric and sulphurous acids are expelled. When the temperature is below 392° (Fahr.), there are ammoniacal salts and needles of sulphur, which are found in yellowish masses on the scoriæ of lava.

Lastly, when the heat of the erupted bodies is below 212° (Fahr.), the fumerolles eject nothing but steam, azote, carbonic acid and combustible gases. Thus the activity of the exhalations and deposits is in proportion to the incandescence of the lava. At the commencement of the eruption, the orifices throw out a large quantity of substances, from marine salt to carbonic acid; but by degrees the power of elaboration weakens simultaneously with the heat, and the gases ejected gradually diminish in number, and testify, by their increasing rarity, to the approaching cessation of volcanic phenomena. In consequence of the difference which is presented by the exhalations during the various phases of eruptions of lava, observers have, at first sight, thought that each volcano was distinguished by emanations peculiar to itself. Hydrochloric acid was looked upon as one of the normal

products of Vesuvius, and sulphurous vapors as more especial to Etna. It was stated (with Boussingault) that carbonic acid was exhaled especially by the volcanoes of the Andes; and, with Bunsen, it was believed that combustible gases prevailed in the eruptions of Hecla.

In his beautiful investigations into the various chemical phenomena presented by Etna and the neighboring volcanic outlets, such as Vesuvius and Stromboli, M. Fouqué appears to have established as a fact which must be henceforth beyond dispute, that the gradual series of these emanations is just that which would be produced by the decomposition of sea-water. Added to this, we also find in lava iodine and fluorine, both of which we should expect to detect in it on account of their presence in sea-water. The salts of bromine, of which, however, only a slight trace is found in sea-water, have not yet been detected in volcanic products, which, no doubt, proceeds from the difficulty which chemists have experienced in separating such very small quantities.

MELTED ROCKS.

The other mattters ejected by eruptions are of terrestrial origin, and evidently proceed from rocks reduced by heat to a liquid or pasty state; they consist principally of silica and alumina, and contain, besides, lime, magnesia, potash, and soda. Oxides of iron also enter into the composition of lava, to the extent of more than one-tenth, which is a very considerable proportion, and warrants us in looking upon the volcanic flows as actual torrents of iron ore; sometimes, indeed, this metal appears in a pure state. It is to this presence of iron that lava especially owes its reddish color, and the sides of the crater their diversely colored sides.

Compounds of copper, maganese, cobalt, and lead are also met with in lava; but, in comparison with the iron, they are but of slight importance. Lastly, phosphates, ammonia, and gases composed of hydrogen and carbon are discharged during eruptions. The presence of these bodies is explained by the enormous proportion of animal and vegetable matter which is decomposed in

sea-water. Ehrenberg found the remains of marine animalculæ in the substances thrown out by volcanoes.

Is the composition of the lava, and especially that of the vapor and gases, the same in those eruptions which take place at a great distance from the ocean? It is probable that, as regards this point, considerable differences might be established between the products of volcanoes placed on the sea-coast, such as Vesuvius and Etna, and those which rise far in the interior of the land, as Tolima, Jorullo, and Puracé. This comparative study, however, which would be calculated to throw light on the chemical phenomena of deep-lying beds, has as yet been made at only a few points.

HOT WATER UNDER GROUND.

Eruptions are rare in volcanoes situated far from the coast, and when they do take place, scientific men do not happen to be on the spot to study the course of the occurrence. Popocatepetl, one of the most remarkable continental volcanoes, produces a large quantity of hydrochloric acid; the snow from it, which has a very decided muriatic taste, is carried by the rain into the Lake of Tezcuco, where, in conjunction with soda, its forms salt.

When the water, either of sea or rivers, penetrates into the crevices of the terrestrial envelope, it gradually increases in temperature the same as the rocks it passes through. It is well known that this increase of heat may be estimated on the average at least as regards the external part of the planet, at 1° (Fahr.) for every 54 feet in depth. Following this law, water descending to a point 7500 feet below the surface would show, in the southern latitudes of Europe, a temperature of about 212° (Fahr.). But it would not on this account be converted into steam, but would remain in a liquid state, owing to the enormous pressure which it has to undergo from the upper layers.

According to calculations, which are based, it is true, on various hypothetical data, it would be at a point more than nine miles below the surface of the ground that the expansive force of the water would attain sufficient energy to balance the weight of the superincumbent liquid masses, and to be suddenly converted

into steam at a temperature of 800° to 900° (Fahr.). These gaseous masses would then have force to lift a column of water of the weight of 1500 atmospheres; if, however, from any cause, they can not escape as quickly as they are formed, they exercise their pressure in every direction, and ultimately find their way from fissure to fissure until they reach the fused rocks which exist in the depths. To this incessantly increasing pressure we must, therefore, attribute the ascent of the lava into vent-holes of volcanoes, the occurrence of earthquakes, the fusion and the rupture of the terrestrial crust, and, finally, the violent eruptions of the imprisoned fluids.

But why should the vapor thus pervade the subterranean strata and upheave them into volcanic cones, when, by the natural effect of its overcoming the columns of water which press it down, it ought simply to rise toward the bed of the sea from which it descended? In the present state of science, this is a question to which it seems absolutely impossible to give a satisfactory answer, and geologists must at least have the merit of candidly acknowledging their ignorance on this point.

STEAM IN VOLCANIC ERUPTIONS.

The discoveries of natural philosophy and chemistry, which have been the means of making known to us the enormous activity of steam in volcanic eruptions, will doubtless, sooner or later, explain to us in what way this activity is exercised in the subterranean cavities. But at the present time the phenomena which are taking place in the interior of our globe are not better known to us than the history of the lunar volcanoes.

Be this as it may, the direct observations which have been made on volcanic eruptions have now rendered it a very doubtful point whether the lavas of various volcanoes proceed from one and the same reservoir of molten matter, or from the supposed great central furnace which is said to fill the whole of the interior of the planet. Volcanoes which are very close to one another show no coincidence in the times of their eruptions, and vomit forth at different epochs, lavas which are most dissimilar both in

appearance and mineralogical composition. These facts would be eminently impossible, if the craters were fed from the same source.

Etna, the group of the Lipari Isles, and Vesuvius, have often been quoted as being volcanic outlets placed upon the same fracture of the terrestrial crust; and it is added, in corroboration of this assertion, that a line traced from the Sicilian volcano to that of Naples passes through the ever-active furnace of the Lipari Isles. Although the mountain of Stromboli, so regular in its eruptions, is situated on a line slightly divergent from the principal line, and, on the other side, the volcanic isles of Salini, Alicudi, and Felicudi tend from east to west, it is possible, and even probable, that Vesuvius and Etna are in fact situated on fissures of the earth which were once in mutual communication. But during the thousands of years in which these great craters have been at work, no connection between their eruptions has ever been positively certified.

TWO INDEPENDENT VOLCANOES.

Sometimes, as in 1865, Vesuvius vomits forth lava at the same time as Etna; sometimes it is in a state of repose when its mighty neighbor is in full eruption, and rouses up when the lava of Etna has cooled. There is nothing which affords the slighest indication of any law of rhythm or periodicity in the eruptive phenomena of the two volcanoes. The inhabitants of Stromboli state that, during the winter of 1865, at the moment when the sides of Etna were rent, the volcanic impulse manifested itself very strongly in their island by stirring up the always agitated waves of the lava-crater which commands their vineyards and houses.

A comparative calm, however, soon succeeded this temporary effervescence, and in the adjacent island of Volcano no increase of activity was noticed. If the shafts of Etna, Vesuvius, and the interveniug volcanoes, take their rise in one and the same ocean of liquid lava, all the lower craters must necessarily overflow simultaneously with the most elevated. Now, as has often been

noticed, the lava may ascend to the summit of Etna, at a height of 10,827 feet, without a simultaneous flow of rivers of molten stone from Vesuvius, Stromboli, and Volcano, which are respectively but one-third, one-fourth, and one-tenth the height of the former. In like manner, Kilauea, situated on the sides of Mauna-Loa, in the Isle of Hawaii, in no way participates in the eruptions of the central crater opening at a point 9800 feet higher up, and not more than twelves miles away.

If there is any present geological connection between the volcanoes of one and the same region, it probably must be attributed to the fact of their phenomenal depending on the same climatic causes, and not because their bases penetrate to one and the same ocean of fire. Volcanic orifices are not, therefore, "safety valves," for two centers of activity may exist on one mountain without their eruptions exhibiting the least appearance of connection.

OPINIONS OF MEN OF SCIENCE.

Isolated as they are amid all the other formations on the surface of the earth, lavas appear as if almost independent of the rest. Basalts, trachytes, and volcanic ashes, are the comparatively modern products which are scarcely met with in the periods anterior to the Tertiary age. Only a very small quantity of these lavas of eruption has been found in the Secondary and Palæozoic rocks. Formerly, most geologists thought that the granites and rocks similar to them had issued from the earth in a pasty or liquid state; they looked upon them as the "lavas of the past," and believed that these first eruptive rocks were succeeded age after age by the diorites, the porphyries, the trap-rocks, then by the trachytes and the basalts of our own day, all drawn from a constantly increasing depth.

They thought also that, in the future, when the whole series of the present lavas shall have been thrown up to the surface, volcanoes would produce other substances as distinct from the lavas as the latter are from the granite. Granites, however, differ so much from the trachytes and basalts as to render it impossible for us to imagine that they have the same origin; added to which,

the labors of modern savants have proved that, under the action of fire, granite and the other rocky masses of the same kind, would have been unable to assume the crystalline texture which distinguishes them. We are, then, still ignorant how volcanic eruptions commenced upon the earth, and how they are connected with the other great phenomena which have co-operated in the formation of the external strata of the globe.

Considered singly, each volcano is nothing but a mere orifice, temporary or permanent, through which a furnace of lava is brought into communication with the surface of the globe. The matter thrown out accumulates outside the opening, and gradually forms a cone of debris more or less regular in its shape, which ultimately attains to considerable dimensions. One flow of molten matter follows another, and thus is gradually formed the skeleton of the mountain; the ashes and stones thrown out by the crater accumulate in long slopes; the volcano simultaneously grows wider and higher.

MOUNTS INTO CLOUDS AND SNOW.

After a long succession of eruptions, it at last mounts up into the clouds, and then into the region of permanent snow. At the first outbreak of the volcano the orifice is on the surface of the ground; it is then prolonged like an immense chimney through the center of the cone, and each new river of lava which flows from the summit increases the height of this conduit. Thus the highest outlet of Etna opens at an elevation of 10,892 feet above the level of the sea; Teneriffe rises to 12,139 feet; Mauna-Loa, in Hawaii, to 13,943 feet, and, more gigantic still, Sangay and Sahama, in the Cordilleras, attain to 18,372 and 23,950 feet in elevation.

This theory of the formation of volcanic mountains by the accumulation of lava and other matters cast out of the bosom of the earth presents itself quite naturally to one's mind. Most savants, from Saussure and Spallanzani down to Virlet, Constant Prévost, Poulett Scrope and Lyell, have been led, by their investigations, to adopt it entirely; indeed, in the present day it is

scarcely disputed. It is true that Humboldt, Leopold von Buch, and, following them, M. Elie de Beaumont, have put forth quite a different hypothesis, as to the origin of several volcanoes, such as Etna, Vesuvius and the Peak of Teneriffe.

According to their theory, volcanic mountains do not owe their present conformation to the long-continued accumulation of lava and ashes, but rather to the sudden upheaval of the terrestrial strata. During some revolution of the globe, the pent-up matter in the interior suddenly upheaves a portion of the crust of the planet into the form of a cone, and opens a funnel-shaped gulf between the dislocated strata, thus by one single paroxysm producing lofty mountains, as we now see them. As an important instance of a crater thus formed by the upheaval and rupture of the terrestrial strata, Leopold von Buch mentions the enormous abyss of the Isle of Palma, known by the natives under the name of "Caldron," or Caldera.

HUGE FUNNEL-SHAPED CAVITY.

The funnel-shaped cavity is of enormous dimensions, and is not less than four or five miles in width on the average; the bottom of it is situated about 2000 feet above the level of the sea. Lofty slopes, from 1000 to 2000 feet in height, rise round the vast amphitheatre, and abut upon inaccessible cliffs, the upper ledges of which reach a total altitude of 5900 to 6900 feet in height. The highest point, the Pico-de-los-Muchachos, is covered by snow during the winter months; and, although it penetrates to regions of the atmosphere which are of a very different character from those of the rest of the island, the slope that is turned toward the crater is so steep that blocks of stone falling from the summit roll down into the enclosed hollow.

The prodigious cavity in the Isle of Palma was, perhaps, the most striking instance that Leopold von Buch could bring forward in favor of his hypothesis; nevertheless, the exploration of this island, since carried out by Hartung, Lyell and other travelers, is very far from confirming the ideas of the illustrious German geologist. The lofty side walls of the hollow appear to be formed

principally, not of solid lava, which constitute scarcely a quarter of the whole mass, but of layers of ashes and scoriæ, regularly arranged like beds of sand on the incline of a talus. Basalts and strata of ashes lie upon one another in the greatest order round the inclosed hollow, which would be a fact impossible to comprehend if any sudden upheaval, acting in an upward direction with sufficient violence to break the terrestrial crust, had shattered and ruptured all the strata, and by a mighty explosion, opened out the immense Caldron of Palma.

LIKE CRACKS IN BROKEN GLASS.

Finally, if a phenomenon of this kind had taken place, star-formed cracks, like those produced in broken glass, would be visible across the thickness of the upheaved strata, and their greatest width would be turned toward the crater. Now there are no fissures of this kind, and the ravines in the circumference of the volcano, which one might perhaps be tempted to confound with actual ruptures of the ground, become wider in proportion as they approach the sea. The enormous cavity in Palma is, therefore, a crater similar to those of volcanoes of less dimensions. It is, however, certain that the Caldera was once both shallower and less in extent, for the ashes and volcanic scoriæ are easily carried away by the rain, which is swallowed up in the bottom of the basin, and has hollowed out for itself a wide drainage channel in a southwest direction.

M. Elie de Beaumont, as his chief support of Leopold von Buch's hypothesis, brought forward the fact that most of the strata of lava—a section of which may be seen on the sides of Etna, in the immense amphitheatre of the Val del Bove—are very sharply inclined. The celebrated geologist affirmed that thick sheets of molten matter could not run down steep slopes without being very soon reduced, in consequence of the acceleration of their speed, into thin layers of irregular scoriæ. If this were really the case, the position of the thick flows of lava in the Val del Bove must have changed since the date of the eruption. It would then be necessary to admit that they have been violently tilted up after having

been originally deposited on the soil in sheets, which were either horizontal or very gently sloped.

Nevertheless, the recent observations made by Sir C. Lyell, those of Darwin on the cones of the Gallapagos Isles, and of Dana on the lava flows of Kilauea; lastly, the remarks of the Italian savants who studied on the spot the volcanic phenomena of Vesuvius and Etna, have satisfactorily proved that, in modern times, a great number of rivers of lava, and especially that of the Val-de-Bove, in 1852 and 1853, have flowed over steep slopes varying in inclination from 15 to 40 degrees. It must, besides, be understood that the lava which poured over the steepest slopes was exactly that portion which, not having experienced any cause of delay, or met with any obstacle, in its course, presented layers of the most uniform consistence and the most regular action.

CLEFT IN THE EARTH.

One of the strongest arguments of scientific men in favor of the theory of upheaval is, that certain volcanic mountains, especially that of Monte-Nuovo, Pouzzoles, and Jorullo, in Mexico, had been suddenly raised up by the swellings of the soil. Now the unanimous testimony of those who, more than three centuries ago, witnessed the eruption of Monte-Nuovo, is, that the earth was cleft open, affording an outlet to vapor, ashes, scoriæ, and lava, and that the hill, very much lower than some of the subordinate cones of Etna, gradually rose during four days by the heaping up of the matter thrown out. The total volume of this eruption was no doubt considerable, but compared with the amount of matter which flowed down upon Catania in 1669, or with the rivers of lava from Skaptar-Jokul, it is a mass of no great importance.

Added to this, if the soil was really upheaved, how was it that the neighboring houses were not thrown down, and that the colonnade of the Temple of Neptune, which stands at the foot of the mountain, kept its upright position? With regard to Jorullo, which rises to a height of more than 1650 feet, the only witnesses of this volcano making its first appearance were the Indians, who fled away to the neighboring heights, distracted with terror.

We have, therefore, no authentic testimony on which we can base an hypothesis as to any swelling up of the ground in the form of a blister. Quite the contrary, the travelers who have visited this Mexican volcano since Humboldt have discovered beds of lava lying one over the other, as in all other cones of eruption; and more than this, they have also ascertained that none of the strata in the ground overlooked by the mountain have been at all tilted up.

It is true enough that local swellings have often been observed in the burning matter issuing from the interior of the earth; in many places the lava is pierced by deep caverns, and entire mountains—especially that of Volcano—have so many hollows in the rocks on their sides that every step of the climber resounds on them as if in a vault. Besides, the lava itself, being a kind of impure glass, is so pervaded by bubbles filled with volatile matter that, when acted upon by fire, so as to expel the water and the gas, it loses on an average, according to Fouqué, two thirds of its weight.

MIXTURE OF LAVA AND VAPOR.

But these caverns, these hollows and bubbles, proceed from the mixture of the lava with vapor which is liberated with difficulty from the viscous mass, or are caused by the longitudinal rupture of the strata during an eruption, and can in no way be compared to the immense blister-like elevation which would be formed by the strata of a whole district being tilted up to a height of hundreds, or even thousands, of yards, leaving at the summit, between two lines of fracture, room for an immense cavity.

None of these prodigious upheavels have been directly observed by geologists, and none of the legends invented by the fears of our ancestors, referring to the sudden appearance of volcanic mountains, which have been since confirmed. Lastly, the very structure of the peaks which are said to have risen abruptly from the midst of the plains testifies to the gradual accumulation of material that has issued from the bowels of the earth. It is, therefore, prudent to dismiss definitely an hypothesis which marks

an important period in the history of geology, but which, for the future, can only serve to retard the progress of science.

As, when the burning matter seeks an outlet, the earth is generally cleft open in a straight line, the volcanic orifices are frequently distributed somewhat regularly along a fissure, and the heaps of erupted matter follow one another like the peaks in a mountain chain. In other places, however, the volcanic cones rise without any apparent order on ground that is variously cleft, just as if a wide surface had been softened in every direction, and had thus allowed the molten matter to make its escape, sometimes at one point, sometimes at another. From the town of Naples—which is itself built on a half crater in great part obliterated—to the Isle of Nisida, which is an old volcano of regular form, the Phlegræan Fields presents a remarkable example of this confusion of craters.

LANDSCAPE TURNED TO CHAOS.

Some are perfectly rounded, others are broken into, and their circle is invaded by the waters of the sea; grouped, for the most part, in irregular clumps, even encroaching upon one another and blending their walls, they give to the whole landscape a chaotic appearance. As Mr. Poulett Scrope very justly remarks, the aspect of the terrestrial surface at this spot reminds one exactly of the volcanic districts of the moon, dotted over, as it is, with craters.

As the type of a region pierced all over with volcanic orifices, we may also mention the Ishthmus of Auckland, in New Zealand, which Dr. Hockstetter has reckoned, in an area of 230 square miles, sixty-one independent volcanoes, 520 to 650 feet in height on the average. Some are mere cones of tufa; others are heaps of scoriæ, or even eruptive hillocks, which have shed out round them long flows of lava. At one time the Maori chiefs used to intrench themselves in these craters as if in citadels; they escarped the outer slopes in terraces, and furnished them with palisades. At the present day, the English colonists, having become lords of the soil, have constructed their farms and country

houses on these ancient volcanoes, and are constantly bringing the soil under cultivation.

The Safa, in the Djebel-Hauran, is also a complete chaos of hillocks and abysses. On this plateau of 460 square miles, which the Arabs call a "portion of hell," almost all the craters open on the surface of the ground, and not on the summits of volcanoes scattered here and there on the black surface. In every direction there may be seen rounded cavities like the vacuities formed in scoriæ by bubbles of gas, only these cavities are 600 to 900 feet wide, and 65 to 160 deep. Some are isolated; some either touch or are separated by nothing but narrow walls like masses of red or darkish-colored glass. One hardly cares to venture on these narrow isthmuse2, bordered by precipices, and intersected here and there by fissures.

ALWAYS SLOPING IN FORM.

The normal form of the volcanoes in which the work of eruption takes place is that of a slope of debris arranged in a circular form round the outlet. Whether the volcano be a mere cone of ashes or mud only a few yards high, or rise into the regions of the clouds, vomiting streams of lava over an extent of ten or twenty miles, it none the less adheres to the regular form so long as the eruptive action is maintained in the same channel, and the debris thrown out falls equally on the external slopes.

The beauty of the cone is increased by that of the crater. The terminal orifice from which the lava boils out well deserves, from the purity of its outline, its Greek name of "cup," and the harmony of its curve contrasts most gracefully with the declivity of the slope. In some volcanoes the symmetry of the architectural lines is so complete that the crater itself contains a cone placed exactly in the centre of the cavity, and pierced by a second crater in miniature, from which the vapor makes its escape.

Volcanoes in which the eruptive action frequently changes its position—and these are the more numerous class—do not possess this elegance of outline. Very often the upheaved lava finds some weak place in the walls of the crater; it hollows them out at first,

and then, bringing all its weight to bear on the rocks which oppose its passage, it ultimately completely breaks down the edge of the crater, leaving perhaps only one side standing. Among the European volcanoes, Vesuvius is the best example of these ruptured craters: before A. D. 79, the escarpments of La Somma, which now surround with their semicircular rampart the terminal cone of Vesuvius, were the real crater. The portion of it which no longer exists disappeared, and buried under its debris the towns of Herculaneum and Pompeii.

INCREASING DIMENSIONS.

Active volcanoes, however, never cease to increase in all their dimensions, and sooner or later the breach is ultimately repaired; the remains of the former craters are gradually hidden under the growing slopes of the central cone. Thus a former crater on Etna, which was situated at a point three miles in a straight line from the present outlet, at the commencement of the Val del Bove, has been gradually obliterated by the lava of successive eruptions; prolonged explorations on the part of MM. Seyell and Waltershausen have been necessary in order to find it out. The normal form of Etna is that of a cone of debris placed upon a large dome with long slopes, becoming more and more gentle, and descending gracefully toward the sea.

In fact, in most of the eruptions, the lava does not rise as far as the great crater, and breaks through the sides of the volcano so as to flow laterally over the flanks of Etna. These eruptions, succeeding one another in the course of centuries, bring about the necessary result of gradually enlarging the dome which constitutes the mass of the mountain, thus breaking the uniformity of the lateral talus. The same thing occurs with regard to Vesuvius on the side which faces the seacoast. There, the terminal cone stands on a kind of dome, which has been gradually formed by the coats of lava running one over the other. If Vesuvius continues to be the great volcanic outlet of Italy, and rises gradually into the sky by the superposition of lava and ashes, it cannot fail, some time or other, to assume a form similar to that of the Sicilian giant.

The volcanoes which present cones of almost perfect regularity are those which have their terminal outlet alone in a state of activity, and vomit out a large quantity of ashes or other matter which glides readily over the slopes. Among this class of mountains, those which attain any considerable elevation are distinguished by their majesty from all other peaks. Stromboli, although it is not more than 2600 feet in height, is one of the wonders of the Mediterranean. From its proud form, it will readily be understood that its roots plunge down into the sea to an enormous depth ; the slope of debris may be seen, so to speak, prolonged under the water down to the abysses of 3000 to 4000 feet, which the sounding-line has reached at the bottom of the Æolian Sea.

At sight of it one feels as if suspended in the midst of the void, as if the ship was sailing in the air midway up the mountain. This feeling of admiration mingled with dread increases when this great pharos of the Mediterranean is approached during the night over the dark-waved sea. Then the sky above the summit seems all lighted up by the reflection of the lava, and a misty band of vapor may be dimly seen girdling round the body of the volcano. In the daytime the impression made is of a different character ; but it is none the less deep, for the real grandeur of Stromboli consists not so much in the immensity of the mass as in the harmony of its proportions.

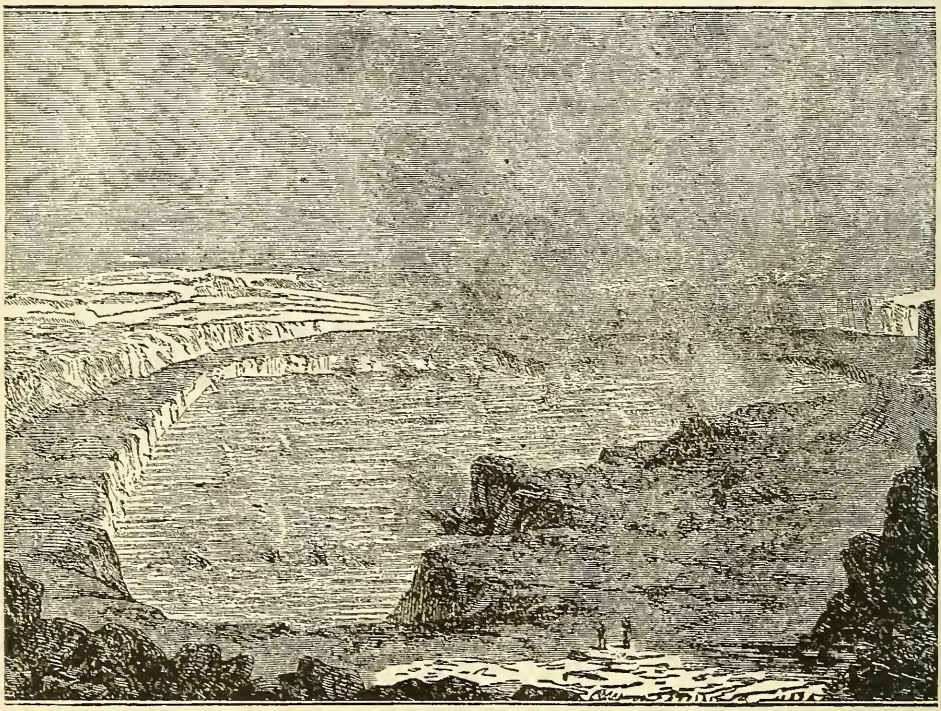
SACRED MOUNTAINS.

Volcanic mountains of an ideal form are those which infant nations have most adored. Among these sacred mountains are the sublime Cotopaxi of the Andes, Orizaba of Mexico, Mauna-Loa of Hawaii, and Fusi-Yama of Japan. The volcanoes of Java, and chiefly those in the eastern portion of the island, also present a very majestic appearance on account of their isolation.

Those on the western side are based upon an undulating plateau, which causes them to lose their appearance of height; but on the east all the volcanic mountains rise up from verdant plains like islands above the waves of the sea, and command the

horizon far and wide with their enormous cones. Between the Merapi and Lavoe mountains lies a depression, the highest ledge of which exceeds the level of the sea by only 312 feet. Between Lavoe and Villis the plain is 230 feet in height. Lastly, the plains which separate the Villis and Kelœet mountains nowhere attain an elevation of more than 200 feet above the ocean.

In the external details of their conformation many of the vol-



A REMARKABLE VOLCANO CRATER, ISLE OF JAVA.

canoes of Java present a regularity of outline which is all the more striking, since they owe it in great part to the monsoon rains, the most destructive agents of the tropical regions. In beating against the mountains, the clouds let fall their burden of moisture on the slopes composed of ashes and loose scoriæ. The latter offer but a slight resistance to the action of the temporary torrents which carry them away, and, crumbling down into the

plains which surround the base of the volcano, are deposited in long slopes, like those caused by avalanches.

In consequence of the fall of all this debris, the sides of the mountain are cut out at intervals by ravines or furrows, which gradually widen from the summit to the base of the mountains, and attain a depth of 200, 600, and 660 feet. There are some volcanoes, such as the Sumbing, in which these ravines assume so perfect a regularity that the whole mountain, with its equidistant furrows and its intermediate walls, resembles a gigantic edifice based upon enormous buttresses, like the nave of a Gothic cathedral.

BEAUTIFUL ISLAND.

Formerly the beauty of the island and the fury of its volcanoes were the cause of its being altogether dedicated to Siva, the god of destruction; and in the very craters of the burning mountains the worshipers of Terror and Death were in the habit of building their temples. In many spots the ruins of these sanctuaries are discovered in the midst of trees and thickets, which the Arab conquerors have left to grow in the formidable cavities of the volcanoes. Semerœ, the loftiest peak in the island, was the sacred mountain par excellence; the Sumbing, which rises in the centre of the island, was the "nail which fastens Java to the earth."

Even in our own time some faithful followers of Siva inhabit a sandy plain, more than four miles wide, which was once the crater of the Tengger volcano; every year they proceed solemnly to pour rice on the summit of an eruptive cone, into the roaring mouth of the monster. In like manner, in New Zealand, the ever-smoking orifice of Tongariro was considered as the only place worthy of receiving the dead bodies of their great chiefs: when cast into the crater, the heroes went to sleep among the gods.

But the volcanic divinities, like most of the other rulers invoked by nations, did not content themselves with the fruits of the earth or the companionship of a few warriors; they also demanded blood, both by their subterranean roarings, by their thundering eruptions, and their devastating rivers of lava. In-

numerable sacrifices have been offered to volcanoes to appease their anger: impelled by a mingled feeling of fear and ferocity, the priests of not a few religions have cast victims with great pomp into the gaping hollows of these immense furnaces.

Scarcely three centuries ago, when the disciples of Christianity were exterminated over the whole length and breadth of Japan, the followers of the new religion were thrown by hundreds into one of the craters of the Unsen, one of the most beautiful volcanoes of the archipelago; but this offering to the offended gods did not appease their anger, for, toward the end of the eighteenth century, this very same mountain and the neighboring summits caused by their eruptions one of the most frightful disasters of any that are mentioned in the history of volcanoes.

Actuated by a feeling of dread very similar to that exhibited by the Japanese priests, the Christian missionaries in America recognized in the burning mountains of the New World not the work of a god, but that of the devil, and went in procession to the edge of the craters to exorcise them. A legend tells how the monks of Nicaragua climbed the terrible volcano of Momotombo in order to quiet it by their conjurations; but they never returned; the monster swallowed them up.

CHAPTER XXII.

VARIOUS KINDS OF LAVA.—BEAUTIFUL CAVE IN SCOTLAND.—CREVICES IN VOLCANOES.—SNOW UNDER BURNING DUST.

LAVA is the most important product of the volcanic fires. The various kinds of lava differ very much in their external appearance, in the color of their substance, and in the variety of their crystals, but they are all composed of silicates of alumnia or magnesia, combined with protoxide of iron, potash or soda, and lime. When the feldspathic minerals predominate, the rock is generally of a whitish, grayish or yellowish hue, and receives the name of trachyte. When the lava contains an abundance of crystals of augite, hornblende, or titaniferous iron, it is heavier, of a darker color, and often more compact; it then takes the generic formation of basalt. Numerous varieties, diversely designated by geologists, belong to this group.

Of all the lavas, trachyte is the least fluid in its form. In many places rocks of this nature have issued from the earth in a pasty state, and have accumulated above the orifice in the shape of a dome, "Just like a mass of melted wax." In this way were formed the great domes of Auvergne, the Puys de Dome and de Sarcouy. In this district the flows of trachytic lava are far inferior in length to the basaltic cheires; the most important do not exceed four or five miles in length.

At the present day, eruptions of trachyte are much more rare than those of other lavas; so much so, that certain authors class all the trachytic rocks among the formations of anterior ages. It is, however, ascertained that most of the American volcanoes and those of the Sunda Archipelago vomit out lava of this nature; the last eruptions of the Æolian Isles, Lipari and Volcano, likewise produced only trachyte and pumice-stone.

This latter substance resembles certain white, yellow, or greenish scoria, which issue like a frothy dross from the furnaces

of our iron-works, and is, like the compact trachyte, of a feldspathic nature. Some mountains are almost entirely composed of it; among others, the Monte Bianco of Lipari, which, viewed from a distance, appears as if covered with snow. Long white flows, like avalanches, fill up all its ravines, from the summit of the mountain to the shore of the Mediterranean; the slightest movement caused by the tread of an animal or a gust of wind detaches from the surface of the slope hundreds of stones, which bound down to the foot of the incline, and are borne away by the waves which bathe the base of the mountain.

In the southern part of the Tyrrhenean Sea, and especially in the vicinity of the Lipari (Æolian) Islands, the water is sometimes covered with these floating stones, almost like flakes of foam. In the Cordilleras the currents of fresh water convey the morsels of pumice to considerable distances. The River Amazon drifts down large quantities of pumice as far as its mouth, more than 3000 miles from the place where it fell into the river. Bates says that the Indians, who live too far away from the volcanoes even to know of their existence, assert that these stones, floating down the river by the side of their canoes, are surely solidified foam.

APPEARANCE OF VARIOUS LAVAS.

The external appearance of various lavas differs even more than their chemical composition. The more or less perfect state of fluidity, and the presence in them of a greater or less quantity of bubbles of vapor, give a very different texture to rocks which are composed of the same elements. Pumice-stone has the appearance of sponge; obsidian looks like black glass, and sometimes it is even semi-transparent.

It is entirely liquid, and issues from the interior of the earth like a stream flowing rapidly over the steeper slopes, and coagulating slowly in large sheets in the low ground and on the gentle inclines whither its own weight has drawn it. The surface of obsidian—for instance, that of Teneriffe—shines with a vitreous glitter; the cleavage of the rock is clean and sharp.

Some less degree of fluidity in the current of lava gives it

sometimes the appearance of resin; this is the stone which is called pechstein (pitch-stone). When the rock, issuing in a state of fusion from the bosom of the mountain, becomes still cooler, it contains innumerable perfectly-formed crystals, and only owes its fluidity to the particles of vapor in its pores. The external layer of the lava is also immediately covered with scoria which float in flakes on the fiery stream. These scoria, too, assume a great variety of shapes; some are mammillated, others are exceedingly rough and irregular.

In the Djebel-Hauran, near the crater of Abu-Ganim, there is an infinity of needles of red lava, about a yard high on the average, and bent in various directions toward the surface of the plateau; one might often fancy them flames half beaten down under the pressure of the wind. According to M. Wetzstein, these strange stone needles proceed from an eruption of flaky lava. In the Sandwich Islands, and in the Island of Réunion, certain crystals of a ferruginous appearance are grouped at the outlet of the crater in herbaceous forms of the most curious and sometimes elegant character.

RESEMBLE HEMP TOW.

Some of the products of the volcano of Mauna-Loa and Kilauea resemble the tow of hemp! These are the whitish filaments which are sometimes carried away by the wind; the Kanakes used to consider them as the hair of Pélé, the goddess of fire.

Among the old basaltic lavas there are some to which the name of "basalt" is more specially applied, which present a columnar disposition with wonderful regularity. These form the enormous monuments, much more imposing than those of man, which seem as if they had been constructed by giant builders, turning their mighty hands to the noble art of architecture, which is still practiced, though on a smaller scale, by us their feeble descendants. These magnificent colonnades of basalt are everywhere attributed to giants.

In Ireland, on the coast of Antrim, the summits of 40,000 prisms, leveled pretty regularly by the waves of the sea, and resembling a vast paved quay, have received the name of the

Giant's Causeway. In Scotland, the beautiful cave of the Isle of Staffa, hollowed out by the action of the waves between two ranges of basaltic shafts, is celebrated as the work of Fingal, the demi-god. In the Sicilian Sea, the Faraglioni Isles, or Isles of the Cyclopes, situated not far from Catania, at the base of Etna, are looked upon by tradition as the rocks cast by Polyphemus on the ships of Ulysses and his companions. Many of these prisms are from 100 to 160 feet high, and are not less than from six to sixteen feet in thickness.

Near Fair Head and the Giant's Causeway some of the shafts connected with the perpendicular cliff of the headland are nearly 400 feet in height. In the Isle of Skye, some of the columns, according to M'Culloch's statement, are still higher. On the other hand, there are also colonnades in miniature, each shaft of which is not more than three quarters of an inch to an inch from the summit to the base; instances of these are found in the basalts of the hill of Morven in Scotland.

BEDS OF LAVA ARRANGED IN COLUMNS.

Some geologists have thought that basaltic columns could not be formed except under the pressure of enormous masses of water; but a comparative study of these rocks in different parts of the world has proved that several beds of lava are arranged in columns at heights considerably above the level of the sea. In this colonnade-like formation of lava there is, however, no phenomenon which is entirely peculiar to basalt. Trachyte, also, sometimes assumes this form, and M. Fouqué has discovered a magnificent instance of it in the island of Milo, in which there is a cliff composed of prismatic shafts 320 feet in height.

Masses of mud when dried in the sun, the alluvium of rivers, beds of clay or tufa, and, in general, all matter which, in consequence of the loss of its moisture, passes from a pasty to a solid state, either in a state of nature or in our manufactories and dwellings, likewise assume a columnar structure similar to that of the basaltic lava. In fact, the entire mass, when gradually losing the moisture which swelled out its substance, can not con-

tract so as to shift the position of all its particles toward the centre; certain points remain fixed, and round each of these the contraction of a portion of the mass takes place.

In basalt, in particular, it is the lower layer which assumes the columnar structure, for these alone cool gently enough to allow the phenomena of contraction to follow the normal course. The highest portion of the mass, being deprived, immediately after its issue from the earth, of the caloric and the steam which filled its pores, is almost immediately transformed into a more or less rough and cracked mass. But this very crust protects the rest of the lava against any radiation, and serves as a covering to the semi-crystalline columns which, by the continual contraction of their particles, are slowly separated from the rest of the mass.

A FOREST OF PRISMS.

When a section of a bed of basaltic lava has been laid bare by the water of a river, the waves of the ocean, or earthquake, the rough stones of the top layers may be seen lying, with or without any gradual transition, on a forest of prisms, sometimes rudimentary in their shape, but often no less regular in their shape than if they had been carved out by the hand of man. Most are of a hexagonal form; others, which were probably subject to less favorable conditions, have four, five or seven faces; but all are definitely separated from one another by their particles gathering round the central axis.

Mr. Poulett Scrope describes a fact which proves the enormous power of this contractile force. The colonnade of Burzet in Vivarais, contains numerous nodules of olivine, many of which are as large as a man's fist; and, in spite of their extreme hardness, have been divided into two pieces, each fixed in one of two adjacent columns. Although the two corresponding surfaces have been polished by the infiltration of water, it is impossible to doubt that the two separate portions were not once joined in the same nodule.

As natural philosophers have verified by experiments on various viscous substances, basaltic shafts are always formed per-

pendicularly o the surface of refrigeration. Now, this surface being inclined, according to the locality, in a diversity of ways, the result is, that the columns may assume a great variety of directions in their position. Although most of them are vertical, on account of the cooling taking place in an upward direction, others, as at St. Helena, take a horizontal direction, and resemble trunks of trees heaped upon a wood-pile.

In other places, as at the Coupe d'Ayzac in Auvergne, the columns of a denuded cliff are arranged in the form of a fan, so as to lean regularly on the wall of the cliff as well as on the ground of the valley. At Samoskœ, in Hungary, a sheet of columnar basalt, very small at its origin, spreads out from the top of a rock like the water of a cascade, and hangs suspended over a precipice, resembling a cupola which has lost its base. Elsewhere masses of basaltic pillars radiate in every direction like the weapons in an immense trophy of arms.

LIKE GIGANTIC BAMBOOS.

An exact prismatic form, is not, however, the only shape assumed by the cooling lava. The phenomenon of contraction takes place in different ways, according to the nature of the erupted matter, the declivity of the slopes, and all the other surrounding circumstances. Thus, in consequence of the sinking of the rock, most basaltic prisms exhibit at intervals a kind of joint, which gives the columns a kind of resemblance to gigantic bamboos. In some lavas these joints are so numerous, and the edges of the stone are so eaten away by the weather, that the shafts are converted into piles of spheroids of a more or less regular form.

At the volcano of Bertrich, in the Eifel, one might fancy them a heap of cheeses; whence comes the name of "Cheese Cave," which is given to one of the caverns which opens in the flow of the lava. Sometimes, too, crystals scattered about in the midst of the mass have served as nuclei to globular concretions formed of numerous concentric layers. Lastly, many currents of molten matter present a tabular or schistose structure, caused, like that of slate, by the pressure of the superincumbent masses.

Although lava, when cooled, is easy enough to study, it is more difficult to observe with any exactitude the molten matter immediately on its exit from the craters or fissures; besides this, the opportunities for study which are afforded to savants are sometimes very dangerous. Long years often elapse before an enquirer can notice at his ease, and without fear of sudden explosions, the mouths of Ætna or Vesuvius filling up to the brink with boiling lava.

Stromboli is the only volcano in Europe in which this phenomenon occurs regularly at closely-recurring intervals, sometimes of only five minutes, or even more frequently. When an observer stands on the highest edge of the crater, he sees, about 300 feet below him, the waves of a matter which shines like molten iron, and tosses and boils up incessantly; sometimes it swells up like an enormous blister, which suddenly bursts, darting forth eddies of vapor accompanied by solid fragments.

HAS BOILED FOR CENTURIES.

For centuries past the lava has never ceased to boil in the cavity of Stromboli, and it is but very rarely that a period of even a few hours lapses without molten matter overflowing. Thus the crater, which, during the day, is white with steam, and during the night red with the glare of the lava, has served as a light-house for mariners ever since the first vessel ventured upon the Tyrrhenian Sea.

In Nicaragua, to the north of the Great Lake, the volcano of Masaya (or "Devil's Mouth") presents a spectacle similar to that of Stromboli, but grander, and perhaps still more regular. After having remained in a state of repose for nearly two centuries, from 1670 to 1853, the monster—which has received the name it bears from the frightful turbulence of its burning waves—resumed all its former activity. In this crater the enormous bubbles of lava, which ascend from the bottom of the abyss and throw out a shower of burning stones, break forth in a general way every quarter of an hour.

The volcano of Isalco, not far from Sonsonate, in the State of

San Salvador, is also one of the most curious on account of its regularity. Its first breaking out was noticed on the 29th of March, 1783, and since this date it has almost always continued to increase in size by throwing outside its cavity ashes and stones. Some of its eruptions, remarkable for their comparative violence, have been accompanied by flows of lava; but, generally, the crater of Isalco confines itself to hurling burning matter to a height of 39 to 46 feet above its crater; explosions follow one another at intervals of every two minutes. The total elevation of the cone of debris above the village of Isalco being 735 feet, and the slope of the side of the mass being, on the average, 35 degrees, M. von Seebach, one of the observers of the volcano, has been able to calculate approximately the bulk and regular increase of the mountain. In 1865 the mass of debris was about 35,000,000 of cubic yards, giving an increase of about 491,000 cubic yards every year, or 56 cubic yards every hour. The volcano, therefore, might be looked upon as a gigantic hour-glass.

WORLD-RENOWNED CRATER.

Of all the craters in the world, the one which most astonishes those who contemplate it is the crater of Kilauea, in the island of Hawaii. This volcanic outlet opens at more than 3900 feet of elevation on the sides of the great mountain of Mauna-Loa, which is itself crowned by a magnificent funnel-shaped crater 2735 yards across from one brink to the other. The elliptical crater of Kilauea is no less than three miles in length and seven miles in circumference. The hollow of this abyss is filled by a lake of lava, the level of which varies from year to year, sometimes rising and sometimes falling like water in a well.

In a general way, it lies about 600 to 900 feet below the outer edge, and, in order to study its details, it is necessary to get on to a ledge of black lava which extends round the whole circumference of the gulf; this is the solidified edge of a former sheet of molten matter, similar to those circular benches of ice which, in northern countries, border the banks of a lake, and even in spring still mark the level the water has sunk from. The surface

of the sea of fire is generally covered by a thick crust over its whole extent; here and there the red lava-waves spring up like the water of a lake through the broken ice. Jets of vapor whistle and hiss as they escape, darting out showers of burning scoria, and forming cones of ashes on the crust 60 to 100 feet in height, which are so many volcanoes in miniature.

Intense heat radiates from the immense crater, and a kind of hot blast makes its way through all the chinks in the vertical walls of the sides. In the midst of the hot vapors, one feels as if lost in a vast furnace. During the night time an observer might fancy himself surrounded with flames; the atmosphere itself, colored by the red reflection of the vent holes of the volcano, seems to be all on fire.

RUSHES THROUGH THE OPENING.

The level or the fire lake of Kilauea is incessantly changing. In proportion as fresh lava issues forth from the subterranean furnace, the broken crust affords an outlet to other sheets of molten matter and fresh heaps of scoria, and gradually the boiling mass rises from ledge to ledge, and ultimately reaches the upper edge of the basin. Sooner or later, however, the level rapidly sinks. The fact is, that the burning mass contained in the depths of the abyss gradually melts the lower walls of solid lava; these walls ultimately give way at some weak points in their circumference, a crevice is produced in the outer face of the volcano, and the liquid matter, "drawn off" like wine from a vat, rushes through the opening made for it.

The flow increases the orifice by the action of its weight on the sill of the opening, and by melting the rocks which oppose its passage, and then, running down over the slopes, flows into the sea, forming promontories on the shore. In 1840 the crater was full to the brink, when a crack suddenly opened in the side of the mountain. This fissure extended to a distance of 131 feet from its starting-point, and vomited forth a stream of lava 37 miles long and 16 miles wide, which entirely altered the outline of the sea-coast, and destroyed all the fish in the adjacent waters. Mr.

Dana estimated the total mass of this enormous flow as equal to 7,200,000 cubic yards—that is, to a solid body fifty times as great as the quantity of earth dug out in cutting through the Isthmus of Suez.

The enormous basin of Kilauea, 1476 feet deep, remained entirely empty for some time, and the former lake of lava left no other trace of its existence than a solid ledge like those which had been formed at the time of previous eruptions. Since this date the great cauldron of lava has been several times filled and several times emptied, either altogether or in part.

OUTLET FOR OVERFLOW.

Almost all the volcanoes which rise to a great height, get rid, like Kilauea, of their overflow of lava through fissures which open in their side walls. In fact, the column of molten matter which the pressure of the gas beneath raises in the pipe of the crater is of an enormous weight, and every inch it ascends toward the mouth of the crater represents an expense of force which seems prodigious. The more or less hypothetical calculations which have been made as to the degree of pressure necessary for the steam to be able to act on the lava-furnace lead to the belief that the outlet-conduits of volcanoes, and consequently the mass of liquid stone to be lifted, are not less than nine miles in depth. Various geologists—among others Sartorius von Waltershausen, the great explorer of Etna—believe that the volcano-shafts are of a still more considerable depth. The rocks of the terrestrial surface, limestone, granite, quartz, or mica, are of a specific gravity two and a half times superior to that of water, while the planet itself, taken as a whole, weighs nearly five and a half times as much as the same mass of distilled water; the density of the interior layers must therefore increase from the circumference to the center. With regard to the proportion of this increase, it is established by a calculation, the whole responsibility of which must rest upon its authors. Baron Waltershausen has ascertained, by means of a great number of weighings, that the lava of Etna and that of Iceland have a specific gravity of 2.911.

The presumed consequence of this fact is that the rocks thrown out by the volcanoes of Sicily and Iceland proceed from a depth of seventy-seven to seventy-eight miles (?). Thus the shaft which opens at the bottom of the crater of Etna would be no less than seventy-seven miles deep, and the lava which boils in this abyss would be lifted by a force of 36,000 atmospheres, an idea altogether incomprehensible by our feeble imaginations. There would, then, be nothing astonishing in the fact that a mass of lava, which is sufficiently heavy to balance a pressure of this kind, should, in a great many eruptions, melt and break through the weaker parts of its walls, instead of ascending some hundreds or thousands of feet higher, so as to run out over the edge of the upper crater.

When the side of the mountain opens, and affords a passage to the lava, the fissure is always perceptibly vertical, and those which are continued to the summit pass through the very mouth of the volcano. In a general way, these fissures of eruption are of considerable length, and are sufficiently wide to form an impassable precipice. Before these fissures become obliterated by the lava or by other debris—such as the snow and earth of avalanches—they may be traced out by the eye as deep furrows hollowed out on the mountain side.

DEPRESSIONS FILLED WITH SNOW.

In 1669 the lateral fissure of Ætna extended over more than two-thirds of the southern side—from the plains of Nicolosi to the terminal gulf of the great crater. In like manner, in the Isle of Jan Mayen, the volcano of Beerenberg, 7514 feet high, presents from top to bottom a long depression filled up with snow, which is nothing else than a fissure of eruption. On other mountains, especially in Montserrat, Guadeloupe, and Martinique, these fissures have assumed such dimensions that the peaks themselves have been completely split in two.

Through outlets of this kind the lava jets out, first making its appearance at the upper part, where the declivity is generally steeper, then springing out below on the more gentle slopes of the lower regions of the mountain.

At the source itself the lava is altogether fluid, and flows with considerable speed—sometimes, on steep slopes, faster than a horse can gallop; but the course of the molten stone soon slackens, and the liquid, hitherto dazzling with its light, is covered by brown or red scoria, like those of iron just come out of a furnace. These scoria come together, and, combining, soon leave no interstices between them beyond narrow vent-holes, through which the molten matter escapes. The scoria then form a crust, which is incessantly breaking with a metallic noise, but gradually consolidates into a perfect tunnel round the river of fire; this is the cheire, thus named on account of the asperities which bristle on its surface.

STANDING ON A THIN SURFACE.

Any one may safely venture on the arch-shaped crust, although only a few inches above the mass in state of fusion, without any fear of being burnt, just as in winter we trust ourselves on the sheets of ice which cover a running stream. The pressure of the lava succeeds in breaking through its shell only at the lower parts of its flow, in spots where the waves of burning stone fall with all their weight. Then the envelope is suddenly ruptured and the mass springs out like water from a sluice, pushing before it the resounding scoria, and swelling out gently in the form of an enormous blister; it then again becomes covered with a solid crust, which is again broken through by a fresh effort of the lava.

Thus the river, surrounding itself with dikes, which it constantly breaks through, gradually descends over the slopes, terrible and inexorable, so long as the original stream does not cease to flow. The only means of diverting the current is to modify the incline in front of it, either by opposing obstacles to it to throw it to either side, or by preparing a road for it by digging deep trenches, or by opening up above some lateral outlet for the pent-up lava. In 1669, at the time of the great eruption which threatened to swallow up Catania, all these various means were adopted in order to save the town. On one side the inhabitants

worked at consolidating the rampart, and placed obstacles across the path of the current to turn it toward the south.

Other workmen, furnished with shovels and mattocks, ascended along the edge of the flow, and, in spite of the resistance offered by the peasants, tried to pierce throuh the shell of scoria, and thus, by tapping the stream, to open fresh outlets for the molten matter. These means of defense partly succeeded, and the terrible current which, at its source near Nicolosi, had been able to melt and pierce through the volcanic cone of Monpilieri at its thickest point (this cone standing in its path) was turned from its course toward the centre of Catania, and destroyed nothing but the suburbs.

The radiation from the lava being arrested by the crust of scoria, which is a very bad conductor of heat, the temperature of the air surrounding a flow of lava rises but very slightly. The Neapolitan guides have no fear in approaching the Vesuvian lava in order to stamp the rough medals made of it, which they sell to foreigners. At a distance of a few yards from the vent-holes in the cheire the trees of Etna continue to grow and blossom, and some clumps, indeed, may be seen flourishing on an islet of vegetable earth lying between two branches of a flow of burning lava. And yet, by a contrast which at first sight seems incomprehensible, it sometimes happens that trees which are distant from any visible flow of molten matter suddenly wither and die.

VINEYARDS BLIGHTED.

Thus, in 1852, at the time of the great eruption from the Val del Bove, on the eastern slopes of Mount Etna, vineyards and vines, covering a considerable area, and situated at a distance of more than half a mile below the front of the flow, were suddenly dried up, just as if the blast of a fire had burnt up their foliage. In order to explain this curious phenomena, it is necessary to admit that some rivulets of the great lava river must have penetrated under the earth through the fissures of the soil, and have filled up a subterranean cavity in the mountain exactly below the vineyards that were destroyed; the roots being con-

sumed, or deprived of the necessary moisture, the trees themselves could not do otherwise than perish.

On lofty mountains in a state of eruption, the masses of snow and ice, which are covered by the fiery currents which issue from the volcanic fissures, do not always melt, and some have been preserved under the scoria for centuries, or even thousands of years. Lyell has discovered them under the lava of Etna, American geologists under the masses thrown out by the crater of Mount Hooker, Darwin under the ashes in Deception Island, in the Terra del Fuego, M. Philippi under the flows of the volcano Nuevo de Chillan, which in 1861 erupted through a glacier.

There every bed of snow which falls during the winter remains perfect under the coat of burning dust which is ejected from the outlet of eruption, and sections made through the mass of debris show for a great depth the alternate black and white strata of the volcanic ashes and the snow. In 1860 the crater of the mountain of Kutlagaya, in Iceland, hurled out simultaneously into the air lumps of lava and pieces of ice all intermingled together.

BURIED LAVA STILL BURNING.

In like manner, the immense flows of lava in Iceland have left in a perfect state of preservation the trunks of the Sequoias, and other American trees, which adorned the surface of the island during the ages of the Tertiary epoch, at a time when the mean temperature of this country was 48° (Fahr.); that is, 42° to 44° above that which it is at present. Although the radiation from the lava is so slight that it neither melts the ice nor burns the trunks of buried trees, yet, on the other hand, the heat and fluidity of the lava are maintained in the central part of the flow for a very considerable number of years. Travelers state that they have found deeply buried lava which was still burning after it had remained for a century on the mountain side.

Although the lava covers up and often preserves the snow and the ice, which are doubtless defended against the heat by a cushion of spheroidal particles of humidity, it immediately converts into steam the water with which it comes in contact. The

liquid mass, being suddenly augmented to about 1800 times its former volume, explodes like an enormous bombshell, and hurls away, like projectiles, all the objects which surround it. A serious occurrence of this kind is recorded, which took place in 1843, a few days after the formation of a fissure in Mount Etna, from which a current of molten matter issued, making its way toward the plain of Bronte.

A crowd of spectators, who had come from the town, were examining from a distance the threatening mass, the peasants were cutttng down the trees in the fields, others were carrying off in haste the goods from their cottages, when suddenly the extremity of the flow was seen to swell up like an enormous blister, and then to burst, darting forth in every direction clouds of steam and volleys of burning stones. Everything was destroyed by this terrible explosion—trees, houses and cultivated ground ; and it is said that sixty-nine persons, who were knocked down by the concussion, perished immediately, or in the space of a few hours.

LIKE GUNPOWDER.

This disaster was occasioned by the negligence of an agriculturist, who had not emptied the reservoir on his farm ; the water, being suddenly converted into steam, had caused the lava to explode with all the force of gunpowder.

The quantity of molten matter which is ejected by a fissure in one single eruption is enormous. It is known that the current of Kilauea, in 1840, exceeded 6550 millions of cubic yards. That which proceeded from Mauna-Loa, in 1835, produced a still larger quantity of lava, and extended as far as a point seventy-six miles from the crater. Flows of this kind are certainly rare ; but there are some recorded in the earth's history which are still more considerable. Thus the volcano of Skaptar-Jokul, in Iceland, was cleft asunder in 1873, and gave vent to two rivers of fire, each of which filled up a valley ; one attained a length of fifty miles, with a breadth of fifteen miles ; the other was of less dimensions, but the depth of the mass was in some places as much as 492 feet. A subterranean fissure, ninety-nine miles in length, which

cleaves in two the ground of Iceland, was doubtless filled up with lava along its entire length, for hillocks of eruption sprung up on various points of this straight line.

It has been calculated that the whole of the lava evacuated by the Skaptar in this great eruption was not less in bulk than 655,000 millions of cubic yards, a mass equivalent to the whole volume of Mont Blanc; it would be a quantity sufficient to cover the whole earth with a film of lava 0.0393 inch in thickness. As to the celebrated flow from the Monti Rossi, which threatened to destroy Catania, in 1669, it seems very trifling in comparison; it contained a mass of molten stone which was estimated at 1310 millions of cubic yards. On how trifling a scale, therefore, are these ordinary eruptions compared with the surface of the globe! They are, however, phenomena perceptible enough to man, in all his infinite littleness.

CHAPTER XXIII.

VOLCANIC PROJECTILES.—EXPLOSIONS OF ASHES.—SUBORDINATE VOLCANOES.—MOUNTAINS REDUCED TO DUST.—FLASHES AND FLAMES PROCEEDING FROM VOLCANOES.

THE lava swelling up in enormous blisters above the fissures from which it flows in a current over the slopes is far from being the only substance ejected from volcanic mountains. When the pent-up vapor escapes from the crater with a sudden explosion, it carries with it lumps of molten matter, which describe their curve in the air, and fall at a greater or less distance on the slope of the cone, according to the force with which they were ejected.

These are the volcanic projectiles, the immense showers of which, traced in lines of fire on the dark sky, contribute so much during the night time to the magnificent beauty of volcanic eruptions. These projectiles have already become partially cooled by their radiation in the air, and when they fall are already solidified on the outside, but the inside nucleus remains for a long time in a liquid or pasty state. The form of these projectiles is often of an almost perfect regularity.

Each sphere is in this case composed of a series of concentric envelopes, which have evidently been arranged in the order of their specific gravity during the flight of the projectile through the air. The dimensions of these projectiles vary in each eruption; some of them are one or more yards in thickness; others are nothing but mere grains of sand, and are carried by the wind to great distances.

In most eruptions, these balls of lava, still in a fluid and burning state, constitute but a small part of the matter thrown out by the mountain. The largest proportion of the stone ejected proceeds from the walls of the volcano itself, which break up under the pressure of the gas, and fly off in volleys, mingled with the products of the new eruption. This is the origin of the dust or

ashes which some craters vomit out in such large quantities, which too, are the causes of such terrible disasters.

When the impetus of the gas confines itself to forming a fissure in the side of the mountain, the fragments of rocks which are broken up and reduced to powder are compratively small in quantity. They are projected in clouds out of the fissure, and, falling like hail round the orifice, are gradually heaped up in the form of a cone on the side of the mountain from which they arose. In Europe, the enormous circumference of Etna presents more than 700 of these subordinate volcanoes, some scarcely higher than an Esquimaux hut, and others, like the Monti Rossi, Monte Minardo, Monte Ilici, several hundred yards high, and more than half a mile wide at the base.

SCANTY GROWTH OF BROOM.

There are some which are entirely sterile, or covered only by a scanty vegetation of broom, and are marked out by a red, yellow, or even black color on the main body of Etna ; those situated on the lower slopes are covered with trees or planted with vines, and sometimes contain admirable crops in the very cavity on their summit. These cones of ashes, springing up like a progeny on the vast sides of their mother mountain, give to Etna a singular appearance of vital personality and of creative energy. The same phenomenon occurs on the volcanoes of Hawaii, which carry on their declivities thousands of subordinate cones.

In the formation of these hillocks a real division of labor takes place. The rocks and heavier stones fall either on the edge of the crater or in the gulf itself. The ashes and light dust are shot up to a much greater height, and, hurried along by the impulse of the wind, fall far and wide, like the chaff of corn winnowed in a threshing-floor. Thus the slope of the cone toward which the wind directs the ashes is always more elongated, and rises to a greater height on the edge of the crater. On Etna, where the wind generally blows in the direction of west to east, the eastern slope of the hillocks is more developed than on the opposite side. It must, perhaps, be attributed to the action of the wind blowing on the

heights, and not, as Siemsen, the geologist, supposes, to the obliquity of the shaft of the crater, that all the scoria and ashes fall to the north of the orifice of the volcano Nuevo de Chillan, in Chili.

The phenomena which take place when the ashes issue from the mouth of the crater itself do not differ from those which are observed at the outlets in fissures. In the former case, however, the mass of rocks reduced to powder is so considerable that the rain of ashes assumes all the proportions of a cataclysm. It has sometimes happened that, during a paroxysm of volcanic energy, the whole summit of a mountain, for a depth of several thousands of feet, has been hurled into the air, mingled with a cloud of vapor and the smoke of burning lava.

Thus Etna, if we are to believe Ælianus, was once much loftier than it is in our time, and on the north of the present terminal cone there may, in fact, be noticed a kind of platform which seems to have been the base of a summit twice as high as the present crest. The whole of the Val del Bove is probably an empty space left by the disappearance of a former cone.

REDUCED TO POWDER.

With regard to Vesuvius, it is known that, in the year 79 of the present era, the whole of that part of the mountain which was turned toward the sea was reduced to powder, and that the debris of the cone, nothing of which now remains except the semicircular inclosure of La Somma, buried three towns and a vast extent of plain. The ashes and dust, mingled with white vapor rising in thick eddies, ascended in a column to a point far above the summit of the volcano, until, having reached those regions of the atmosphere where the rarefied air could no longer sustain them, they spread out into a wide umbrella-like shape, the falling dust of which obscured the sky.

Pliny the younger compared this vault of ashes and smoke to the foliage of an Italian pine curving at an immense height over the mountain. Since this memorable epoch the height of the column of vapor has been measured which has issued from Vesu-

vius at the time of several great eruptions, and it has been sometimes found that it reached 23,000 to 26,000 feet; that is, six times higher than the summit of the volcano itself.

One of these explosions of entire summits which caused most terror in modern times was that of the volcano of Coseguina, a hillock of about 500 feet high, situated on a promontory to the south of the Bay of Fonseca, in Central America. The debris hurled into the air spread over the sky in a horrible arch several hundreds of miles in width, and covered the plains for a distance of 25 miles with a layer of dust at least 16 feet thick. At the very foot of the hill the headland advanced 787 feet into the bay, and two new islands, formed of ashes and stones falling from the volcano, rose in the midst of the water several miles away.

PUMICE-STONE ON THE WATER.

Beyond the districts close round the crater, the bed of dust, which fell gradually, became thinner, but it was carried by the wind more than forty degrees of longitude toward the west, and the ships sailing in those waters penetrated with difficulty the layer of pumice-stone spread out on the sea. To the north, the rain of ashes was remarked at Truxillo, Honduras, and at Chiapas, in Mexico; on the south, it reached Carthagena, Santa Martha, and other towns of the coast of Grenada; to the east, being carried by the counter current of the trade-winds, it fell on the plains of St. Ann's, in Jamaica, at a distance of 800 miles. The area of land and water on which the dust descended must be estimated at 1,500,000 square miles, and the mass of matter vomited out could not be less than 65,500 million cubic yards.

The uproar of the breaking up of the mountain was heard as far as the high plateaux of Bogota, situated 1025 miles away in a straight line. While the formidable cloud was settling down round the volcano, thick darkness filled the air. For forty-three hours nothing could be seen except by the sinister light of the flashes darting from the columns of steam, and the red glare of the vent holes opening in the mountain.

To escape from this prolonged night, the rain of ashes, and

the burning atmosphere, the inhabitants who dwelt at the foot of Coseguina fled in all haste along a road running by the black water of the Bay of Fonseca. Men, women, children, and domestic animals travelled painfully along a difficult path, through quagmires and marshes. So great, it is said, was the terror of all animated beings during this long night of horror, that the animals, themselves, such as monkeys, serpents, and birds, joined the band of fugitives, as if they recognized in man a being endowed with intelligence superior to their own.

A large number of volcanoes have diminished in height, or have, indeed, entirely disappeared, in consequence of explosions, which reduced their rocks to powder, and distributed them in thick sheets on the ground adjacent. Mount Baker, in California, and the Japanese volcano of Unsen, have thus raised the level of the surrounding plains at the expense of a diminution in their own volume. In 1638, the summit of the peak of Timor, which might be seen like a light-house from a distance of 270 miles, exploded, and blew up into the air, and the water collecting, formed a lake in the enormous void caused by the explosion.

GREAT DESTRUCTION OF LIFE.

In 1815, Timboro, a volcano in the island of Sumbara, destroyed more men than the artillery of both of the armies engaged on the battle-field of Waterloo. In the island of Sumatra, 550 miles to the west, the terrible explosion was heard, and, for a radius of 300 miles round the mountain, a thick cloud of ashes, which obscured the sun, made it dark like night even at noonday. This immense quantity of debris, the whole mass of which was, it is said, equivalent to thrice the bulk of Mont Blanc, fell over an area larger than that of Germany.

The pumice-stone which floated in the sea was more than a yard in thickness, and it was with some difficulty that ships could make their way through it. The popular imagination was so deeply impressed by this cataclysm, that at Bruni, in the island of Borneo, whither heaps of the dust vomited out by Timboro, 870 miles away to the south, had been carried by the wind, they

date their years from "the great fall of ashes." It is the commencement of an era for the inhabitants of Bruni, just as the flight of Mohammed was for the Mussulmans.

The friction of the steam against the innumerable particles of solid matter which are darted out into the air is the principal cause of the electricity which is developed so plentifully during most volcanic eruptions. In consequence of this friction, which operates simultaneously at all points in the atmosphere which are reached by the volcanic ashes, and vapor, sparks flash out which are developed into lightning. The skies are lighted up not only by the reflection from the lava, but also by coruscations of light which dart from amid the clouds.

When the vast canopy of vapor spreads over the summit of the mountains, numerous spirals of fire whirl round on each side of the clouds, which, as they unroll, resemble the foliage of a gigantic tree. Doubtless, also, the encounter of two aerial currents may contribute to produce lightning in the columns of vapor; yet, when the latter are slightly mingled with ashes, they are rarely stormy.

ACTUAL FIRES SEEN.

Although the evolution of electricity in the columns of vapor and ashes vomited out by volcanoes has never been called in question, the appearance of actual flames at the time of volcanic eruptions was for a long time disputed. M. Sartorius von Waltershausen, the patient observer of Etna, has maintained that neither this mountain, nor Stromboli, nor any other volcano, has ever presented among its phenomena any fire properly so called, and that the supposed flames were nothing more than the reflection of the red or white lava that was boiling in the crater.

On the other hand, Elie de Beaumont, Abich and Pilla positively assert that they have seen light flames on the summit of Vesuvius and Etna. It would, however, be very natural to believe that inflammable gases might be liberated and take fire at the outlet of those immense shafts which place the great subterranean laboratory of lava in communication with the outer air.

This question was, however, resolved in the affirmative at the time of the eruption of Santorin, and popular opinion was right in opposition to most men of science. All those who were able to witness, at its commencement, the upheaval of the lava at Cape Georges and Aphroessa, have certified to the appearance of burning gas dancing above the lava, and even on the surface of the sea. All round the upheaved hillocks, bubbles of gas, breaking forth from the waves, became kindled as they came in contact with the burning mass, and were diffused over the water in long trains of white, red or greenish flames, which the breeze alternately raised or beat down; sometimes a smart puff of wind put out the fire, but it soon recommenced to run over the breakers; by approaching it carefully, fragments of paper might be burnt in it, which lighted as they dropped. On the slopes of the volcano of Aphroessa fire, rendered of a yellowish hue by salts of soda, sprung out from all the fissures, and rose to a height of several yards. On the rather older lava of Cape Georges the trains of flame were less numerous; there, however, bluish glimmers might be seen flitting about in some spots over the black ridges of lava.

GROWING MOUNTAINS.

Added to this, are not the flames at Bakou, on the coast of the Caspian Sea, produced by the volcanic action of the ground? The "growing mountains" in the neighborhood are mud-volcanoes, and we must doubtless attribute to the same subterranean activity the production of the hydrogen gas which burns in an "eternal flame" in the temple of the Parsi. During some of the evenings in autumn, when the weather is fine and the sun has heated the surface of the ground, the flames occasionally make their appearance on the hills, and for several hours may be seen the marvelous spectacle of a train of fire stretching along the country without burning the ground, and even without scorching a blade of grass.

Next to lava and ashes, streams of water and mud are the most considerable products of volcanic activity, and the catastrophes which they have caused are perhaps among the most terri-

ble which history has to relate. By means of these sudden deluges, towns have been swept away or swallowed up, whole districts dotted over with habitations have been flooded with mud or converted into marshes, and the entire face of nature has been changed in the space of a few hours.

The liquid masses which descend rapidly from the mountain height do not always proceed from the volcano itself. Thus the local deluge may be caused by a rapid condensation of large quantities of steam which escape from the crater and fall in torrents on the slopes. A phenomenon of this kind must evidently take place in a great many cases, and it was doubtless by a cataclysm of this kind that the town of Herculaneum, at the foot of Vesuvius, was buried.

MELTED SNOW AND ICE.

As regards the lofty snow-clad volcanoes of the tropical and temperate zones, and also those of the frozen regions, the torrents of water and debris—the "water-lava," as the Sicilians call them—may be explained by the rapid melting of immense masses of snow and ice, with which the burning lava, the hot ashes, or the gaseous emanations of the volcanic furnace have come in contact. Thus, in Iceland, after each eruption, formidable deluges, carrying with them ice, scoria, and rocks, suddenly rush down into the valleys, sweeping away everything in their course.

These liquid avalanches are the most terrible phenomena which the inhabitants of the island have to dread. They show three headlands formed of debris, which the body of water descending from the sides of Kutlugaya in 1766 threw out far into the sea, in a depth of 246 feet of water.

Other deluges no less formidable are caused by the rupture of the walls which pen back a lake in the cavity of a former crater, or by the formation of a fissure which affords an outlet to liquid masses contained in subterranean reservoirs. It would be too difficult to explain otherwise the mud-eruptions of several trachytic volcanoes of the Andes—Imbambaru, Cotopaxi, and Carahuarizo. In fact, the mud which comes down from these

mountains often contains a large quantity of organized beings, aquatic plants, infusoria, and even fish, which could only have lived in the calm waters of a lake.

Of this kind is the Pimelodes cyclopum, a little fish of the tribe of the Silurida, which according to Humboldt, has hitherto been found nowhere except in the Andini caverns and in the rivulets of the plateau of Quito. In 1691 the volcano of Imbambaru vomited out, in combination with mud and snow, so large a quantity of these remains of organisms that the air was contaminated by them, and miasmatic fevers prevailed in all the country round. The masses of water which thus rush down suddenly into the plains amount sometimes to millions, or even thousands of millions of cubic yards.

UNDERGROUND LAKES.

Although, in some cases, these eruptions of mud and water may be looked upon as accidental phenomena, they must, on the contrary, as regards many volcanoes, be considered as the result of the normal action of the subterranean forces. They are, then, the waters of the sea or of lakes which, having been buried in the earth, again make their appearance on the surface, mingled with rocks which they have dissolved or reduced to a pasty state.

A remarkable instance of these liquid eruptions is that presented by Papandayang, one of the most active volcanoes in Java. In 1792 this mountain burst, the summit was converted into dust and disappeared, and the debris, spreading far and wide, buried forty villages. Since this epoch a copious rivulet gushes out in the very mouth of the crater, at a height of 7710 feet, and runs down into the plain, leaping over the blocks of trachyte. Round the spring pools of water fill all the clefts in the rocks, and boil up incessantly under the action of the hot vapors which rise in bubbles; here and there are funnel-shaped cavities, in which black and muddy water constantly ascends and sinks with the same regularity as the waves of the sea; elsewhere, muddy masses slowly issuing from small craters flow in circular slopes over mounds of a few inches or a yard in height; lastly, jets of steam dart out of

all the fissures with a shrill noise, making the ground tremble with the shock.

All these various noises, the roaring of the cascades, the explosion of the gaseous springs, the hoarse murmur of the mud-volcanoes, the shrill hissing of the fumaroles, produce an indescribable uproar, which is audible far away in the plains, which, too, has given to the volcano its name of Papandayang, or "Forge," as if one could incessantly hear the mighty blast of the flames and the ever-recurring beating of the anvils.

In volcanoes of a great height it is rarely found that eruptions of water and mud are constant, as in the Papandayang; but temporary ejections of liquid masses are frequent, and there are, indeed, some volcanoes which vomit out nothing but muddy matter. The volcano of Aqua (or water), the cone of which is gently inclined like that of Etna, and rises to about 13,000 feet in height, into the regions of snow, has never vomited anything but water; and it is, indeed, stated that lava and other volcanic products are entirely wanting on its slopes.

INHABITANTS DRIVEN OUT.

Yet in 1541, this prodigious intermittent spring hurled into the air its terminal point and poured over the plains at its base, and over the town of Guatemala, so large a quantity of water, mingled with stones and debris, that the inhabitants were compelled to fly with the greatest haste, and to reconstruct their capital at the foot of the volcano of Fuego. This new neighbor, however, showed that he was as much or more to be dreaded than their former one, for the violent eruptions from the mountain compelled the inhabitants of the second town to again migrate and to rebuild their capital at a point twenty miles to the northwest.

Several volcanoes in Java and the Philippines also give vent, during their eruptions, to large quantities of mud, sometimes mingled with organic matter in such considerable proportions that they have been utilized as fuel. In 1793, a few months after the terrible eruption of Unsen, in the island of Kiousiou, an adjacent

volcano, the Miyi-Yama, vomited, according to Kampfer, so prodigious a quantity of water and mud that all the neighboring plains were inundated, and 53,000 people were drowned in the deluge; unfortunately, we have no historical details of this catastrophe. Of all the eruptions of mud, the best known is that of Tunguragua, a volcano in Ecuador, which rises to the south of Quito to 16,400 feet in height.

In 1797, at the time of the earthquake of Riobamba, a whole side of the mountain sank in the downfall, with the forests which grew on it; at the same time, a flow of viscous mud issued from the fissures at its base, and rushed down into the valleys. One of these currents of mud filled up a winding defile, which separated two mountains, to a depth of 650 feet, over a width of more than 1000 feet, and damming up the rivulets at their outlet from the side valleys, kept back the water in temporary lakes; one of these sheets of water remained for eighty-seven days.

A CURIOUS TRANSITION.

The volcanic mud, therefore, has this point of resemblance with the lava—that it sometimes flows out through the crater, as on Papandayang; sometimes through side craters, as on Tunguragua. Doubtless, when the volcanic muds have been better studied, we shall be enabled to trace the transition which takes place by almost imperceptible degrees between the more or less impure water escaping from volcanoes, and the burning lava more or less charged with steam. This transition is, however, already noticed in the ancient matter which the water has carried down and deposited in the strata at the foot of volcanic mountains. These rocks, known under the name of tufa, trass, or perperino, are nothing but heaps of pumice, scoria, ashes, and mud, cemented together by the water into a species of mortar or conglomerate, and gradually solidified by the evaporation of the humidity which they contained.

Of this kind, for instance, is the hardened stone which, for eighteen centuries, has covered the city of Herculaneum with a a layer of 50 to 150 feet in thickness. Among rocks of various

formations, there are but few which exhibit a more astonishing diversity than the tufas. They differ entirely in appearance and physical qualities, according to the nature of the materials which have formed them, the quantity of water which has cemented them, the greater or less rapidity with which their fall and desication take place; lastly, the number and distribution of the chinks which are produced across the dried mass, and have been filled up with the most different substances. Many kinds of tufa resemble the most beautiful marble.

LITTLE CONES.

The small hillocks, which are specially called mud-volcanoes, or salses, on account of the salts which are frequently deposited by their waters, are cones which differ only in their dimensions from the mighty volcanoes of Java or the Andes. Like these great mountains, they shake the ground, and rend it, in order to discharge their pent-up matter; they emit gas and steam in abundance, add to their slopes by their own debris, shift their places, change their craters, throw off their summits in their explosions; lastly, some of these salses are incessantly at work, while others have periods of repose and activity. In nature, transitions merge into one another so perfectly, that it is difficult to discover any essential difference between a volcano and a salse, and between the latter and a thermal spring.

Mud-volcanoes exist in considerable numbers on the surface of the earth, and, like the volcanoes of lava, the neighborhood of the sea-coast is the principal locality where we find their little cones. In Europe, the most remarkable are those which are situated at the two extremities of the Caucasus, on the coasts of the Caspian Sea, and on both sides of the Straits of Yenikale, which connect the Sea of Azof with the Black Sea. On the east, the mud-springs of Bakou are especially distinguished by their combination with inflammable gases; on the west, those of Taman and Kertch flow all the year round, but especially during times of drought, pouring out large quantities of blackish mud. One of these mud-volcanoes, the Gorela, or Kuku-Oba, which, in the

time of Pallas, was called the "Hell," or Prekla, on account of its frequent eruptions, is no less than 246 feet in height, and from this crater, which is perfectly distinct, muddy streams have flowed one of which was 2624 feet long, and contained about 850,000 cubic yards.

The volcanitos of Turbaco, described by Humboldt, and the maccalube of Girgenti, which have been explored, since Dolomieu, by most European savants who have devoted themselves to the study of subterranean forces, are also well-known examples of mud-springs, and may serve as a type to all the hillocks of the same character. In winter, after a long course of rains, the plain is a surface of mud and water forming a kind of boiling paste, from which steam makes its escape with a whistling noise; but the warmth of spring and summer hardens this clay into a thick crust, which the steam breaks through at various points and covers with increasing hillocks. At the apex of these cones a bubble of gas swells up the mud like a blister, and then bursts it, the semi-liquid flowing in a thin coat over the mound; then a fresh bubble ejects more mud, which spreads over the first layer already become hard, and this action continues incessantly until the rains of winter again wash away all the cones.

DEPENDENT ON THE TIDES.

This is the ordinary course of action of the salse, sometimes interrupted by violent eruptions. On the coast of Mekran the mud-volcanoes are not only subject to the action of the seasons, but also depend on the action of the tides, although many of them are from 9 to 12 miles from the Indian Ocean. At the time of the flow the mud rises in great bubbles, accompanied by a hoarse murmur, like the distant roar of thunder. The highest cone is not more than 246 feet high, and stands seven miles from the shore.

In a general way, the expulsion of mud and gas is accompanied by a discharge of heat, but in some salses, like those of Mekran, the matter ejected is not higher in temperature than the surrounding air, as if the expulsion of the mud from the ground was an entirely superficial phenomenon. Occasionally, in peat

bogs, the ground cracks and cold mud is ejected from the fissure; and then, after this kind of eruption, the spongy soil sinks and again levels down. Is this eruptive phenomenon similar to that presented by the mud volcanoes, and caused by the fermentation of gases in the midst of substances in a state of putrefaction? This is M. Otto Volger's idea; and it would be difficult to give any other explanation of the phenomenon.

CHAPTER XXIV.

Volcanic Thermal Springs. — Geysers. — Springs in New Zealand.—Craters of Carbonic Acid.

VOLCANOES, both of lava and mud, all have, either on their sides or in the vicinity of their base, thermal springs, which afford an outlet to their surplus water, gas, and vapor. Most even of those mountains which are at present tranquil, but which were once centres of eruption, continue to manifest their activity by vapors and gas, like furnaces in which the flames are extinct, but the smoke is still rising. Although lava and ashes no longer make their escape from the crater of lateral fissures, yet numerous hot springs, formed by the condensation of the steam, generally serve as a vehicle for the gas pent up in the depths of the mountain.

We may reckon by hundreds and thousands the "geysers," the "vinegar springs," and other thermal springs in countries once burning with volcanoes, the fires of which are extinct, or at least quieted down for a period more or less protracted. Thus the former volcanoes of Auvergne; the mountains of the Eifel, on the Rhine, the craters of which contain nothing but lakes or pools; the Demavend, with its mouth filled up with snow—all still exhale here and there, through springs, as it were, a feeble breath of their once mighty vitality.

The volcanic regions of the earth where thermal springs gush out, are very numerous. In Europe we have Sicily, Iceland, Tuscany, and the peninsula of Kertch, and Yellowstone Park, in America—land so rich in volcanoes—the springs warmed by subterranean vapor are still more numerous, and there are some on the sides of the volcano Nuevo del Chillan which gush out through a thick bed of perpetual snow.

A lateral gorge of the valley of Napa, in California, called the "Devil's Canyon," may be quoted as one of the most striking examples of the active production of thermal waters. The narrow

ravine, filled with vapor rising in eddies, opens on the side of a red and bare mountain, that one might fancy was scorched by fire. The entry to the ravine follows the course of a rivulet, the boiling waters of which are mingled with chemical substances horrible to the taste. Innumerable springs—some sulphurous, others charged with alum or salt—gush out at the base of the rocks. There are both warm and cold springs, and hot and boiling; some are blue and transparent, others white, yellow or red with ochre. In a cavity which is called the "Sorcerers' Caldron" a mass of black and fetid mud boils up in great bubbles.

Higher up, the "Devil's Steam-boat" darts out jets of gaseous matter, which issue puffing from a wall of rock: fumerolles may be seen by hundreds on the sides of the mountain. All these various agents either murmur, whistle, rumble or roar, and thus a tempest of deafening sounds incessantly fills the gorge. The burning ground, composed of a clayey mud—in one spot yellow with sulphur, and in another white with chalk—gives way under the feet of the traveler who ventures on it, and gives vent to puffs of vapor through its numberless cracks. The whole gorge appears to be the common outlet of numerous reservoirs of various mineral waters, all heated by some great volcanic furnace.

THE DEVIL'S CANYON.

The ravine of Infernillo (Little Hell), which is situated at the base of the volcano of San Vincente, in the centre of the Republic of San Salvador, presents phenomena similar to those of the "Devil's Canyon." There, too, a multitude of streams of boiling water gush from the soil, which is calcined like a brick, and eddies of vapor spring from the fissures of the rock with a noise like the shrill whistle of a locomotive. The most considerable body of water issues from a fissure 32 feet in width which opens under a bed of volcanic rocks at a slight elevation above the bottom of the valley.

The liquid stream, partially hidden by the clouds of vapor which rise from it, is shut out to a distance of 130 feet as if by a force-pump, and the whistling of the water pent up between the

rocks reminds one of the furnace of a manufactory at full work. One might fancy that it was the respiration of some prodigious being hidden under the mountain.

The hottest springs which gush out on the surface of the ground, such as those of Las Trincheras and Comangillas, do not reach the temperature of 212° (Fahr.); but we have no right to conclude from this that the water in the interior of the earth does not rise to a much more considerable heat. It is, on the contrary, certain that water descending into the deepest fissures of the earth although still maintaining a liquid state, may reach, independently of any volcanic action, a temperature of several hundred degrees ; being compressed by the liquid masses above it, it is not converted into steam. At a depth which is not certainly known, but which various savants have approximately fixed at 49,000 feet, water of a temperature exceeding 750° (Fahr.) ultimately attains elasticity sufficient to overcome the formidable weight of 1500 atmospheres which presses on it ; it changes into steam, and in this new form mounts to the surface of the earth through the fissures of the rocks.

FRESH JETS OF STEAM.

Even if this steam, passing through beds of a gradually decreasing temperature, is again condensed and runs back again in the form of water, still it heats the liquid which surrounds it, and increases its elasticity ; it consequently assists the generation of fresh jets of steam, which likewise rise toward the upper regions. Thus, step by step, water is converted into steam up to the very surface of the earth, and springs out from fissures.

In Iceland, California, New Zealand and several other volcanic regions of the world, jets of steam mingled with boiling water are so considerable as to rank among the most astonishing phenomena of the planet. The most celebrated, and certainly the most beautiful, of all these springs is the Great Geyser of Iceland. Seen from afar, light vapors, creeping over the low plain at the foot of the mountain of Blafell, point out the situation of the jet of water and of the neighboring springs. The basin of siliceous stone

which the Geyser itself has formed during the lapse of centuries is no less than fifty-two feet in width, and serves as the outer inclosure of a funnel-shaped cavity, seventy-five feet deep, from the bottom of which rise the water and steam. A thin liquid sheet flows over the edges of the basin, and descends in little cascades over the outer slope.

The cold air lowers the temperature of the water on the surface, but the heat increases more and more in all the layers beneath; every here and there bubbles are formed at the bottom of the water, and burst when they emerge into the air. Soon bodies of steam rise in clouds in the green and transparent water, but, meeting the colder masses on the surface, they again condense. Ultimately they make their way into the basin, and cause the water to bubble up; steam rises in different places from the liquid sheet, and the temperature of the whole basin reaches the boiling-point; the surface swells up in foamy heaps, and the ground trembles and roars with a stifled sound. The cauldron constantly gives vent to clouds of vapor, which sometimes gather round the basin, and sometimes are cleared away by the wind.

LEAP OUT WITH A CRASH.

At intervals, a few moments of silence succeed to the noise of the steam. Suddenly the resistance is overcome, the enormous jet leaps out with a crash, and, like a pillar of glittering marble, shoots up more than 100 feet in the air. A second and then a third jet rapidly follow; but the magnificent spectacle lasts but for a few minutes. The steam blows away; the water, now cooled, falls in and round the basin; and for hours, or even days, a fresh eruption may be waited for in vain. Leaning over the edge of the hole whence such a storm of foam and water has just issued, and looking at the blue, transparent, and scarcely-rippled surface, one can hardly believe, says Bunsen, in the sudden change which has taken place.

The slight deposits of siliceous matter which are left by the evaporation of the boiling water have already formed a conical hillock round the spring, and, sooner or later, the increasing curb

of stone will have so considerably augmented the pressure of the liquid mass in the spring that the waters must ultimately open a fresh outlet beyond the present cone. From the experiments and observations made by Forbes as to the formation of the layer of incrustations round the jet, this spring must have commenced its eruptions ten centuries and a half ago, and they will probably cease in a much shorter space of time.

Not far from the Geyser, the mound of deposits from which is not less than 39 feet in height, there are a number of pools which once acted as basins for springs which gushed up through them, but are now nothing but cisterns filled with blue and limpid water, at the bottom of which may be seen the mouth of a former channel of eruption. A shifting in the position of the centre of activity takes place in the Geyser, just as in mud volcanoes and incrusting springs. Several springs lying on the same terrestrial fissure as the great jet d'eau, the Strokkr, the Small Geyser, and some others, present phenomena which are nearly similar, and are evidently subject to the action of the same forces.

IN CONTACT WITH HOT LAVA.

The vicinity of the active volcanoes of Iceland warrants us, however, in supposing that the water produced by the melting of the snow on Blafell does not require to descend many thousands of yards into the earth in order to be converted into steam. There is no doubt that, at no very great depth below the surface, they come in contact with burning lava, which gives them their high temperature. By reproducing in miniature all the conditions which are thought to apply to the Icelandic springs—that is, by heating the bases of tubes of iron filled with water and surmounted by a basin—Tyndall succeeded in producing in his laboratory charming little geysers, which jetted out every five minutes.

About the centre of the northern Island of New Zealand the activity of the volcanic springs is manifested still more remarkably even than in Iceland. On the slightly winding line of fissure which extends from the southwest to the northeast, between the ever active volcano of Tongariro and the smoking island of

Whakari, in Plenty Bay, thermal springs, mud fountains, and geysers rise in more than a thousand places, and in some spots combine to form considerable lakes.

In some localities the hot vapors make their escape from the sides of the mountains in such abundance that the soil is reduced to a soft state over vast surfaces, and flows down slowly to the plains in long beds of mud. For a distance of more than a mile a portion of the Lake of Taupo boils and smokes as if it was heated by a subterreanean fire, and the temperature of its water reaches, on the average to 100° (Fahr.). Farther to the north, the two sides of the valley, through which flows the impetuous river of Waikato after its issue from Lake Taupo, present, for more than a mile, so large a number of water jets, that in one spot as many as seventy-six are counted. These geysers, which rise to various heights, play alternately, as if obeying a kind of rhythm in their successive appearances and disappearances.

While one springs out of the ground, falling back into its basin in a graceful curve bent by the wind, another ceases to jet out. In one spot a whole series of jets suddenly become quiet, and the basins of still water emit nothing but a thin mist of vapor. Farther on, however, the mountain is all activity; liquid columns all at once shine in the sun, and white cascades fall from terrace to terrace toward the river. Every moment the features of the landscape are being modified, and fresh voices take a part in the marvelous concert of the gushing springs.

About the middle of the interval which separates the Lake of Taupo from the coast of Plenty Bay, several other volcanic pools are dotted about, all most remarkable for their thermal and jetting springs. One of them, however, is among the great wonders of the world. This is the Lake of Rotomahanna, a small basin of about 120 acres, the temperature of which, being raised by all the hot springs which feed it, is about 78° (Fahr.). Dr. von Hochstetter has not even attempted to count the basins, the funnels, and the fissures from which the water, steam-mud, and sulphurous gases make their escape.

APPENDIX.

DEATH CAME TO EVERYONE IN ST. PIERRE WITH THE QUICKNESS OF A CANNON SHOT.—SULPHUROUS GAS PERMEATED EVERY PLACE AND WAS EXPLODED AT ONCE.—PRIESTS' BODIES FOUND IN THE ATTITUDE OF PRAYER.—CALM, NOT PANIC, WRITTEN ON THE LINES OF DEAD FACES.—DARING FEAT OF PROFESSOR HEILPRIN IN ASCENDING MOUNT PELEE AFTER THE ERUPTION.

BY J. MARTIN MILLER.

DESOLATION absolute, ruin and dusky death—that is St. Pierre. In the world's history, since mankind was a part of it, there has never been so instant an extinction of human life as in this town of Martinique. Tidal waves, so called, great fires, plagues and other visitations have slain thousands, but not by means so sudden. In a moment, by the explosion of a volume of sulphur gas that had poured down the sides of Mont Pelée, a population was destroyed, a town flung into ruin, vegetation scorched from the face of the earth and panic shook the souls of thousands.

I have been wandering among streets of silence, wading through ash fall like new snow, stumbling upon corpses and looking through threatening mists at Pelée, towering into darkness of its own making, its sides steaming and smoking from a thousand vents. Not one soul remains in St. Pierre. The soldiers who were guarding it against loot, the men who were gathering the fragments which a few days ago were walking these tumbled avenues, singing, laughing, and making love, have fled. Probably none will guard it any more. One does not watch the tombs of the forgotten.

It was through the courtesy of the navy people that passage was given from Fort-de-France to the dead city. The government

tug Potomac took a party of newspaper men, besides the officers of the cruiser from Holland that lay alongside of the Dixie, but that steamed away for Curacao in the evening. When we arrived at the ruins the captain said: "If the mountain is threatening, I shall blow the whistle and you must return instantly, for if you delay another cloud may sweep down the side and asphyxiate you."

We had been ashore perhaps a couple of hours, the party widely scattered, every man for himself, when half a dozen sharp calls from the tug caused us to look up.

A thunderous darkness was falling down the slopes of Pelée. From new vents close at hand, two of them in the town itself, were gushing steam and dust, rolling and bursting to a height of a hundred feet. Other clouds were rising from ravines that have been cut into the sides of the mountains, and the inclined planes that reached from the sea verge to the peak smoked, as with the firing of armies. Indeed, the spectacle, except for the gloom that fell lower and lower out of the heavens, suggested nothing so much as lines of troops, miles in length, and in many columns fighting their way into the sky.

STORY OF A RACE FOR LIFE.

A yellow haze began to blow over the city, bringing a sharp and irritating smell of sulphur. It was time to be off. We did not stay on the order of our going. It is alleged of one of geologists that he cleared twenty feet on the first bound. Leaping down the terraces, blundering over foundation stones strewn in piles over the streets, passing corpses, shriveled and half buried in ash drifts, we made for the shore where two boats were waiting us.

The last men came creeping laboriously down from the ruins with their arms laden with loot—not the kind that counts as such, but old dishes, door knobs, mantel ornaments, kitchen utensils and the like. Give a little credit to the men of the press. They found a safe with silver in it, and a silver coffee pot, and left it. An army man found a brass crucifix in the cathedral ruins and left it. In the tombs of the cemetery were lamps, wire frames

for immortelles, statuettes and so on, and not one was abstracted. The things borne away as souvenirs are mostly of that rubbish which in a year or two will find its way into the ash barrel.

RESCUING A NEGRO WOMAN.

The company had no sooner been rowed back to the tug than two fumaroles broke out where some of the men had been exploring and the drift of yellow haze grew thicker. The anchor had been pulled up when a solitary figure appeared, moving northward along the road that connected St. Pierre with Fort-de-France. The glasses showed a negro woman with a bundle on her head. The captain sent back his gig to bring her aboard, if possible, for she had gone to the beach, as if seeking rescue.

The two sailors reported her as "daffy." She refused to leave the land. Though going squarely away from Fort-de-France she insisted that she was bound for that town, and she was left to go her way. In a few minutes she would be upon the slope of Pelée.

Succeeding this eruption came a violent tropical rain, with some minutes of dust fall, which caused the mountain to steam yet more vehemently, and a hundred vents at the sea verge gave an effect of great industries. The rain caused the flanks of the peak to shine with a bleak and peculiar light as of snow in shadow. Steam, roofing in the awful rents blown in the volcano's side, made them appear like entrances to hell.

Suddenly the darkness lifted, the eruptions along the slopes diminished and for the first time since the tragedy, Pelée lifted her head into clear sky, 4,000 feet above, disclosing the southwest wall of her crater blown out and a rolling column of steam arising from it. Then the likeness to Vesuvius was remarkable. The curving bay was Naples, and the sea was a brilliant green—the green of emerald.

EVIDENCE OF AN EARTHQUAKE.

The appearance of St. Pierre is that of an adobe village in Arizona. The town is all unroofed, it has lost its upper stories, and it is the color of clay. It has been half buried in the ashy

outpour of this last eruption and albeit they positively assert that there has been no earthquake but only a volcanic cyclone, I am sure there has been a shock. The once town was not under watch at every moment, and the damage which has recently been wrought could have occurred in a minute.

That a cyclone tore across the flank of Pelée is sure, but that does not account for the twisting of iron grills and fences and the wrenching asunder of great masses of stone. Could anything have done these things except an upheaval of the earth? After the first eruption, which destroyed the life, the houses were little injured. Though roofless and charred, the contents of many shops and houses were almost intact, whereas yesterday it was shaken to its foundations. Shops are not distinguishable from dwellings, and many streets are guesswork.

By a mighty thrust of force the volcano has shaken the masonry into wild confusion. There are heaps in the streets as high as the barricades of Paris revolutions. Interiors of homes, offices and churches are as deeply filled as the yards, and often it is a shred of wall paper or decorated plaster that is the only determining point in deciding which is the inside and which the outside of a building. The cathedral towers, that had remained standing after the first eruption, were hurled down, and the fine bells that chimed so placidly, lie buried among the rubbish, the largest bell remaining unbroken, it would seem, though it weighs probably a ton and a half.

CATHEDRAL IN RUINS.

The fine altar of carved marble, with its brazen lamps and candles, is a wreck, and of any other ornamented portions of the building not a shred is visible. The inside is deep in dust, and a sailor, in wading through it, stumbled upon a gnarled, brown, uncertain looking object, seamed with white.

"Hey, here's another o' them poor stiffs," he called to a comrade.

And a body it was surely, one of those who had sought refuge in the place to pray away adversity.

Bodies of the priests were also found here, one of them, it is said, in the attitude of prayer, but the uplifted hands in other cases may have been mere proofs of the fall of burning dust. It is also said that the bodies of a throng were found in the square before the church, and that they were early collected and burned, but this again is not substantiated.

That on the morning of a feast crowds would come and go is presupposed, and there was also to be a procession, with music and banners, and the company may have been gathering for that, but in time of trouble and anxiety the call of the church to her children is not unheeded, and these victims, leaving early mass, or going to the later service, were better prepared for death than they could have been at any other time.

ONCE GAY CITY.

The other churches had their complement of worshipers also, but social and official life had not awakened. How hard it is to realize that there was life at all. One pictures the city gay in the sunshine, with its crowds dressed in colors fairly dazzling to visitors from lands of frost, with oleander and flamboyant hibiscus and amaryllis blazing in the gardens, as a thing that never existed in the same land or century with this mournful, hideous wreck. Here was the club, here a hotel, there stood the Hotel de Ville, over yonder was the theater, not a very substantial place, 'tis true, but seating 1500; back of it was the jail, out there by the cemetery was the bishop's palace, here was a hospital, here a market, a bank, a factory. All are blent in one wide downfall.

A curious phase of it all is the absence of floors, doors, roofs, window frames, and furniture. Everything of wood was destroyed, save part of the little kitchens and outbuildings in the yards. It is the stoniest of ruins.

Sharp as the flame was that burst from the sulphur cloud its duration was of the briefest. The destruction of St. Pierre was no doubt accomplished in less than thirty seconds. A tumbling green vapor, five miles of flame, and all was over. The cyclone with which the sea wind hurled itself upon the place, and the rain

of dust that followed, did a kindly act of burial. In that gust of flame, that explosion of gases which may have been ignited by fires in kitchens, everything of life disappeared. Trees were uprooted and killed. What was a pretty garden in front of the city hall is a waste of ash, with a stagnant fountain in the center, the only green thing in the view being its water.

But, stop! What are these points pricking through the gray? Grass, as surely as the sun shines! Tropic vitality is deep and strong. The fire that blasted the sea foot of this mountain did not reach far into the soil and nature is asserting the power of life over death. And another token of life: here are ants at work. Tiny creatures, of small account in the world's economy, overlooked by men, have survived men, and are digging themselves out of this new Pompeii as busy, as placidly uninterested in human affairs as on the morning of the calamity.

But the trees and flowers, the splendors of the torrid islands, are no more. Stately palms, at least fifty feet from base to crown, lie at length like slain giants, their roots already mantling with a fungus of brilliant orange. Hardly a stalk remains of the dracenas, cacti, bananas and other showy denizens of the public and private parks. The foliage that mantled the cliffy steeps behind the town is brown, a line of scorch extending from the sea along the hills, as clear as the line of char in a forest fire.

MINIATURE HANGING GARDEN.

This city of St. Pierre was a miniature hanging garden. It fronted the sea with a pretty esplanade, of which nothing is left except old howitzers used as posts, and from that point it climbed the hill in terraces which were stopped by dangerous cliffs that are the edge of an old mud flow from Pelée. A pleasure ground at one corner of the town, and a statue of the Virgin on a promontory at another, were features that drew attention from tourists as they passed the capes and saw this charming panorama unfold itself, the houses of many colors, shining in a sun of southern brilliancy, flecked by tree shadows and flecked by gorgeous reds and yellow of flowers.

On landing it is found that even a part of the pavement on the beach is gone, or it may be buried under rubbish. The anchor chains and other ship stores along the water front are rusty and add to the look of long desertion. Nobody would imagine that this sea front had a row of shade trees and a mule railroad and benches for travelers and idlers to rest on. Not a hint of them is to be seen. The statue of Christ on the gable of the cathedral lies broken among the stone heaps. Where the band played on pleasant evenings not so much as a cricket chirps. The lighthouse that beckoned ships into the roadstead has disappeared.

NINE LOOTERS VICTIMS OF MONT PELEE.

Yet among the shops are odd survivals—useless cups and saucers, rows of dusty tumblers, toys for children, images of china, tin and plaster. What the loot has been, nobody can know. The place is unsafe for thieves, not because soldiers guard it, but because the mountain does. On the day before yesterday nine negroes were found rummaging through the stores. They were arrested. Pelée broke into eruption and the guards fled leaving the looters at liberty. Yesterday the nine men were found dead. They had not been shot. Pelée still claims its victims.

Much treasure will never be brought to the surface. It is buried as deep as the flowers and lawns on the delectable hills above the city. For those heights are as barren as the glacier fronts of Greenland. As you sail by the mountain you might look for St. Pierre in vain. Some one cries, "There is the city!" But you see no city. Ah, you mean that broken slope, which, more than any other thing, suggests a cornfield in November? A little nearer, and you see that it is like a cemetery in a Latin country. And truly it is a cemetery. Only when you are close in shore can you realize that here was one of the most charming towns in the West Indies.

What happened on that morning? An hour after sunrise Pelée, which had been uneasy for some days, began to send up columns of dust and steam, and mutterings were heard in the earth. What matter? Pelée had tried to frighten Martinique

before. It would shake and smoke for a little; and then quiet down again, after its manner.

Poor people! There was almost time to escape, if you had known. The road to Fort-de-France was open. By running you could have won at least a chance of life. But no. This was the feast of Ascension, and heaven would be good to you.

The tropic day had begun. In woods and gardens on the hillsides the flowers were opening to the heat; a few birds were shrilling, not singing, as with us, but calling to one another; on the walls that fortified the climbing roads against downbreak, quick and dainty lizards were scampering after flies; odors of orange and jasmin blent with the balm of morning and tonic fragrance of the sea. Peacefully rocking in their towers on the Cathedral de la Morillage the bells were humming their call to prayer, and the golden notes went abroad in waves, reaching to the palm-hid villages along the shore.

Chimneys were sending up incense to the domestic gods, and faint notes of unhurried life issued through doors and lattices. The sea sparkled blue and green, the clean surf tumbled musically against the esplanade, and in the roadstead a few vessels swung carelessly. Clumsy pelicans watched at the water's edge for food, and graceful, graceless beggars began their own employment by lining up along the warehouses to watch the horizon and boats and nap between conversations.

OMINOUS RUMBLINGS.

Hark! Above and beneath the pounding surf and ringing bells, a rumble. Only thunder. The rainy season will be here in two or three weeks, and showers are growing usual. The industries of kitchen go on; commonplaces of the street are in exchange; the yawning ones who sleep late because this is holiday are looking at the ceiling and meditating on the sad necessity of getting up.

Again, and louder, that pulsing sound, deep, long, stirring, vague terrors; and this time it does not stop. The rumble grows; a yellow light, a light that would come of a dying sun, not a

sinking one, is upon St. Pierre, making it shadowy and uncertain. How close it is, and what sultriness is in the air! The birds are flying off. The very fish are uneasy, and are leaping from the water. The opaline gar-spite, that swim so near the surface, with bird-like turnings of the head, are putting off to sea. The sailors in the offing are studying the sky with doubtings in their look.

People step into the streets to see why it grows dark. Horses are stamping in the stalls, and the dogs are whining. The rush of the Riviere Blanche is hot, strong and sulphurous. Clouds nearly always rest on Pelée, but not such clouds as these. See, they are rent with thunderbolts, and the gloom is deepening fast! Yet the bells ring on, and there is comfort in them. Take that comfort while you may, for it is nearly over. You, mother, kiss your little ones for the last time. Good father, in the church, commend the souls of those kneeling ones to the All Father, who is to require them, for the hour has come. To every one in St. Pierre this is the last of earth.

STONES BEAT ON THE CATHEDRAL BELL.

Pelée lightens. It shakes from head to foot. A smoky pall descends, blotting the view of Niagaras of boiling mud that are leaping down the slopes. A very devil's tattoo is sounded from the cathedral. The bell man has done his work, and these rapid notes are the pounding of stones that shower from the sky.

On the steamer Roraima the crew and the passengers—West Indians, Americans, English, Germans, Swedes, Italians—who were eagerly questioning, are praying now. On shore there is a movement toward the churches. At the pretty wayside shrines men and women fall to their knees and bend their heads. And so comes death. The cloud, falling with the speed of hail, spreading as a fan, its edge rolling and volleying like a breaker. It is green, a sulphurous, poisonous, unearthly green, with a background of pitchy darkness. It reaches St. Pierre. In one breath the people die. In another moment the cloud turns to fire, with a cannon report.

Now the ash falls thick and hot, and stones from the crater break as they reach the ground with sparks as of coals. But human eyes do not see these things. They are glazed, and stare at vacancy. At one throb 20,000 human hearts have ceased to beat. St. Pierre? There's no such a place. Its citizens abroad are of the race of Ishmael, and homeless. Its streets will be peopled of the lizard and the fer de lance, and weeds and vines hide its ruin.

The rattle of stones is over, the crash of trees, swept from the ground in an inrush of cool air, has ceased, from end to end the city is on fire, but will burn tranquilly till the rains fall, the shipping is in flames or sunk, less ash sifts from the clouds, and after a little there come up from the south black spots that, drawing near begin to wheel above the place of death. They are the vultures.

WAR SHIPS LAND SUPPLIES.

War ships of the nations are beginning to arrive, to express condolence and land supplies. The Dutchman, the Queen Regent, left last night, and to-day, with blither and bang, the flagship Tage rides in, saluting and saluted, the bands on various decks playing airs of other nations in compliment. Visits of ceremony are paid from ship to ship, the officers gasping in comfortless full dress, and the poor devils of marines incased in their stiffest clothing, in order to look their prettiest when the great men come over the side.

Ashore there are few tokens of the tragedy. The people laugh and chatter as they have been doing these hundred and odd years, and ragged urchins dog the strange Americans who go hiking up and down the streets, each several urchin hoping against hope for pennies, and bunching himself among his associates before the statue of Empress Josephine—a native of this island—whenever the photographers seethe in from space and appropriate that work of art. A graceful, pretty statue it is, with its setting of tall palms and park of glossy mangoes.

I try to get a few words from our consul, or agent, Mr. Ayme, but he is excited, half ill, busy, and can think of nothing but

trouble. He is selling news himself and writing magazine articles, so that he has little to offer to newspaper men. As I enter his office I find him in consultation with a professor and two emissaries from a magazine, and am invited to get out. Other people from newspapers relate like experience, and some of them declare war on the consul, alleging that he delays their cable dispatches in order to speed his own.

The fright which shook Fort-de-France on the day when Mont Pelée exploded with such vehemence, has passed. People are still trying to leave the island. Certain of the shops are closed. Windows and doors in some of the best houses are boarded up. Yet the same soldiers and civilians sit in the little cafés, drinking fruit syrups and brandy; the same bronze figures amble up the beach and cool in the surf; the same bare-legged women—of real beauty not a few—are carrying burdens on their heads, up and down the streets, and the same lazy, careless, happy-go-lucky air as usual is suggested in the lounging people about shops and squares.

HOURLY CHURCH SERVICES.

Two things are significant: Hourly service at the church and the incoming of refugees. The services begin at early morning, the interior is draped in mourning, and the bells clang at frequent intervals. You would say, perhaps, that because matins, mass, prayers and all were said so often the congregations would be small, but no; there is a large attendance and a democratic one—negro laborers, French officers, sailors from the Dixie, ragged fellows scared in from the hills, and officials of the town who carry themselves with a certain elegance and conform to European fashions.

These people are on their kness and there is earnestness in their petitions—more earnestness than their worship has shown for many years. And in the shaky, dirty little school buildings in the middle of the city the refugees are quartered, dirty, crowded, not depressed and not unhappy, for if the terror of the mountain hangs over them, at least they are getting food.

Besides these runaways, who are hurrying into the streets, finding reassurance in the company of their fellows, there are others who are beginning a camp in a valley beyond the Fort-de-France. As this is a military station of some account, there is an assurance of order and sanitation, although the French islands are not equal to the Danish and English in respect of cleanliness and settled state. There are batteries masked among the hills, and a venerable stone fort at the head of the harbor, in which the King of Dahomey is a prisoner, with forty or fifty of his wives. From these defences could be thrown, at a moment's notice, a force of troops to cow the riotous and quiet the discontented.

But there are no tokens of impending trouble. The frightened people turn with trust to their lay and cleric leaders, and the arrival of the Yankees, with food to last for weeks and months, causes the hearts of Martinique to leap with thanks. The only danger is that of so great an inrush of the panic-stricken into this small, unprepared city as to menace the health of both newcomers and residents.

SCANDAL IN FOOD SALES.

And free food will draw them to the Fort-de-France quicker than anything else. When and how they will get it and who will get it? Some interesting history will be written about that. Ugly rumors are afloat already of official fingers in the charity pie; of American bread, flour, tents and clothing to be stored in public warehouses, drawn upon for dole, then forgotten and afterward sold for some one's gain. Let us hope that rumor this time hath a lying tongue and that no creature in human guise will trade on the misery of his fellows.

At the hospitals it does not look as if such would be the case. The ill and injured are as well treated as circumstances allow, and their condition is favorable. Those who have been discharged are finding their way out of the district and are seeking safety in Guadeloupe.

Absurd tales reach us of the desertion of the French and English, of warships coming to force the residents away, of a general volcanic outbreak along the Caribbean and a smothering

and sinking of many another new world Pompeii. They reflect the alarm that is felt at this almost unprecedented cataclysm.

Here in Fort-de-France it does not look like desertion. The best that can be done for the injured is being done in the hospitals, civil and military, instead of putting them aboard ship and sending them to Guadeloupe.

Although a few people went into St. Pierre from Fort-de-France and other places to see Mont Pelée in activity, more people were frightened away, and the populace was below rather than above the normal on that morning.

MODE OF BUILDING HOUSES.

Cities are not built in this country as in ours. An American town of 26,000 would spread over several square miles. We can take a place like Meriden, Conn., or Nyack, N. Y., as an example. Only the business district would be congested. But in these West Indian cities the building is continuous. The houses are detached rather than separated, by party walls, yet they stand close, and the new comer erects his house a hand span from his neighbor, if his wall does not actually touch the adjacent property. And the houses are also small, more people rooming over twenty square feet than in many parts of New York. So, although St. Pierre was a mere strip between the cliffs and the sea, extending for hardly a couple of miles, its population was dense and its commerce made it one of the busiest and most attractive cities in the Caribbean. Pompeii was buried deeper and Pompeii was a richer, handsomer town, but the destruction of life was not a tithe of that in Martinique.

Father Jean Alteroche, pastor at Morne Bert, a place of 1400 people, five kilometers above St. Pierre and ten kilometers south of the crater, is one of the very few who can give a clear testimony as to the explosion.

Until the night before the casualty, he said, smoke had been coming from the mountain, but on that night it had subsided. "'Ware Stromboli when its eruption stops," the vineyard people say, who till its slopes. On the fatal morning the priest stood

looking at the peak, wondering what the day was to bring forth, when a dense, whitish smoke began to issue from the mountain and pour down its sides. There was a flash of light and a report. After a little another. Then came a third report louder than the others, and with it the mountain flank was bathed in a mass of flame.

PRIEST'S STORY OF CATASTROPHE.

Father Alteroche and his people took to flight, but before he had gone 200 yards he was thrown down, as by a wind, and burned. Rocks were tossed into the air. A breeze then came from the south, driving back the odors and dust, and as the air cleared he saw St. Pierre below, in flames. None were killed at Morne Bert, but twenty were injured and the place was deserted from that hour. Not a soul remains there. No earthquake was felt at any time during the activities of Pelée, but the falls of stone were accompanied by thunder that pealed through the darkness, and lightning flashes played through the cloud mass as it fell upon the town. Father Alteroche thought he saw flame issuing from the crater.

There are bright fires still burning near the sea front at St. Pierre. You see them as the ship approaches in the night and may fancy they are cremations. No, they are coal yards, lumber yards, naval stores, whose destruction is delayed by the fallen rock and coat of ashes. Here and there one detects odors of drugs, as if they were burning in some cellar, and the rillets of rain water that descend the military road into the town have a marked smell of chemicals, though there was no factory in that quarter.

The heat generated by the explosion of the gas is believed to be 1,800 degrees Fahrenheit. It seared and withered where it did not destroy. Yet, although the statue of the Virgin, which overlooked the sea above the south end of the city was hurled from its pedestal, the pedestal itself remains a white mark, a guide for navigators as of old. I found among the ruins several books that were legible, though the pages were browned and would crumble to dust ere many days. This char affected the whole book rather than the outer leaves.

Extreme heat was noted on the day when the search was made for the consuls' bodies. The engineer was testing the sea water when Pelée was belching black and green clouds, and discovered a temperature of ninety-two degrees. In twenty minutes the heat had fallen to eighty-one degrees. He could not condense the water, it was so warm. In the engine the vacuum dropped from twenty-six inches to eighteen, the pumps refused to take water and the hose was turned on to cool them. During this time the fish in the roadstead were suffering, and many of them leaped eight feet into the air.

And the end is not yet. These eruptions have been felt in one form and another throughout the West Indies. Ocean currents have changed, prevailing winds have gone about, intense heat prevails, as usual, but, what the people insist is not usual, is that to this heat is added the wilting humidity of a New York August.

The ruin on this island is less than in Martinique, though in its physical aspect the eruption of the Soufriere was remarkably like that of Pelée. The Soufriere was supposed to be not dormant, but dead. It was in the same category with sundry dozens of West Indian mountains that have been active within the memory of man, but till recently were looked upon as harmless. Hurricanes, earthquakes, fires, snakes, low prices for sugar and visitations of fever were thought to be enough without adding eruptions, but nature asserts itself from time to time to teach a becoming humility to our species.

MANY WARNINGS FROM LA SOUFRIERE.

The Soufriere lords it over St. Vincent as Pelée does on Martinique, rising over 4000 feet above the sea. It has been quiescent since 1812. There were various warnings of trouble three weeks ago; the ground shook, rumblings were heard and a lake in the crater was discovered. On the 6th of May there were escapes of steam with great noises, and on the 7th three craters were pouring out mud that flowed down the slopes, covered with vapor and uttering stenches of sulphuretted dyrogen. Columns

of cloud rolled upward to a height of eight miles, and others descended, carrying showers of dust and stones and burying the land under a midnight darkness.

The down-coming cloud was likened to flowers and heads of cabbage, leaves of vapor, miles long, incessantly shot through by webs and sheets of electric fire. Hot water flowed over the crater's lip and it is alleged that a glow as of molten lava shone against the under side of the clouds. But if there was lava it did not not flow. Like Pelée, the Soufriere is a mud volcano. Laborers flying from the fields reported danger to the settlements and presently there were regular processions trudging along the roads toward Kingstown and other places out of reach of the bombardment.

NEW CRATERS UNDER FOOT.

For some time it was not known that lives had been lost, and the discovery that 2000 persons had perished in the infernal blast came with crushing force upon the little communities of the island and deepened apprehension which extends to the remotest confines. It is not that the people are all afraid of burial under ashes, but that in these great upheavals new craters break under one's feet and strips of coast slide into the sea, the submarine avalanches falling for hundreds of fathoms, carrying villages and people to eternal burial.

As we steamed into this charming harbor of Kingstown, and saluted the forts and men of war, the first evidence of poverty that we noticed was bread, literally cast upon the waters and floating by in half loaves. The next was a company of bumboat people offering fruits. The laundresses who swarmed aboard were sufficiently and well dressed. The trim gardens on shore, the busy market, with its cotton trees, the laden branches of bread fruit, the stately palms and blazing hibiscus, seemed to betoken prosperity. At the landing platform we were met by the usual crowd of ragged negroes, who insisted on carrying our parcels and cameras, and wanted to show where we could post letters and buy rum.

All hands were out for a penny, and everyone who went ashore was beset by an army of boys who could not be driven off, except with firearms. "God bless Uncle Sam!" "The Americans are the best people—spare us a penny, master." "We'll show you the way to the American consul, sah. It's where de Stars an' Stripes are flyin'. Dey's the bes' flag." It was with remarks like these, so different from the whining and threatening of city vagrants, that we were greeted. If you assured these cheerful tramps that you hadn't money to spare for them, they added: "Well, you's an American, master, so God bless you, all the same." How could you keep any coppers in your pocket after that?

After a stop at the Kingstown Club several of the newspaper men engaged conveyances of a philanthropist for a drive to Georgetown, twenty-two miles away, over one of the loveliest roads in the world, a rival to the Cornice of Italy. We met beggars all the way, some of them flying from the Soufriere, or seeking relief supplies in Kingstown. Ere long we began to find the road strewn with stones as large as filberts, a recent fall from the volcano, and the fields of cane and arrow root were powdered over with the same gray dust as is falling from Pélee .

ASH DEVASTATION AT ST. VINCENT.

Our slow mules and tipsy driver did not get us into Georgetown till nearly dark. We found it a street of slab shacks, with a stone church and parsonage, a Wesleyan chapel, a school, with a porch that had fallen to the ground under a weight of volcanic ashes, a few stone houses, but mostly poor cabins hidden among palms, bananas and sea grapes. It was hot and close and dirty. Piles of ash had been swept from roofs and shoveled from the walk.

A fall of eighteen inches of this ash has taken place, but the rains have beaten it into mud and have washed tons of it into the sea. All is sad colored and gray, as in the neighborhood of Pelée, but the scorching has been lighter. Soufriere, the terrible, that Georgetown keeps in the corner of its eye, is withdrawn in sulky majesty behind a curtain of steam, but a great mud flow that has

descended from it reeking with vapors, and now and again we hear the ticking of ashes on porches of corrugated iron, or on the shingles.

Nearly every window in Georgetown, on the side toward the sea and away from the mountain, has been smashed. That means the ascent of stones to a great height and their entrance into a western air current that hurled them back in the direction of the volcano. One window shows a hole as round and clean as if made with a shell from a 5-inch gun. Stones varying from a pea to a cocoanut in size are strewn over the fields and streets in millions, and you may scoop up half-ounce fragments with both hands, anywhere.

Just at the edge of the town and near the cooling sea are two hospital tents, both filled with burned survivors of the eruption and attended by volunteer surgeons from Barbadoes and hospital stewards of the English army. These are apparently the only white people in Georgetown.

EXPERIENCE OF A SURGEON.

One of these surgeons, Dr. Colin Bowen, of Bridgetown, gives this experience as illustrating the range of the phenomena: "At 2.30 on the seventh of May I was at home ninety miles away. All down in the west it was dark. We were figuring on rain, but as the thermometer kept steady, we said it must be dust. At 4 o'clock I felt the dust as I was driving. At 4.45 it began to collect on the window sills. It kept getting worse, till at 8 o'clock I could ride only on a bicycle, veiled and wearing a pair of shades. Next morning we had from a quarter to three-quarters of an inch of dust all over our town, like sand. The villagers here say that the victims died in stifling dust, like that which we know in Barbadoes as the dust of 1812. He heard explosions, but thought they were guns in Venezuela, where one of the periodical revolutions is on."

Especially vivid are the recitals of the victims in the women's hospital, a bleak building at the end of the town. It would need a Vedder or a Goya to paint the score at night, when the injured,

sitting on their cots, their black skins the blacker against the sheets and gowns, suggest mummies in their winding sheets. They wave their bandaged arms and nod their bandaged heads; their eyes shone in the light of the single lantern, and the rag tag and bob tail of the place, that has stolen in to hear the narrative for the hundredth time, stands fixed as graven images and listens in awe.

Says one: "At 11 o'clock I lost de sun. Warm watah began to fall, with hashes. We heard a tremendous noise an' stones like a man's head come down. A thick cloud rose up from de mountain an' when it fall, we burned. De floor was fifteen inches thick with hashes. This, where I live, in Rabacca. Windows were smashed in, an' the hashes it come into wall houses—what you call stone houses—just de same as ours. When de hashes pass off it is so hot—so hot—I burn, all in my t'roat. Oh, God, how I burn in de t'roat. I want watah, but dey ain't no watah, 'an some of dem, dey die. I most die, too, for I all on fire in de inside, an' I lay down an' I can't move after dat till de door open an' de hashes is gone."

QUEER OLD WOMAN.

Another old woman, with glowing eyes and gesturing arms, looking in the half light like a witch, tells how the thunders began calling from the sea and rolled up toward the peaks, reversing the order on Pelée. There was a great fall of ash, then sand, then rocks, in the hamlets about the sugar mills above Georgetown, whereas in that place the stones fell first, then grit, then pebbles. The first stones were cold like ice, but after a while they broke into sparks when they struck the ground, as if hot coals had been drawn from an engine. All the time Soufriere was growling, "Vo-vo-vo-vo-vo-vo!"

The people closed their doors and windows and prayed. The ash came down in suffocating quantities, bringing an awful heat that penetrated the houses—mere thatched huts, the most of them—and buried the country in midnight darkness. The people crowded into these shelters, were half buried and half stifled in the blistering fall. After the cloud had passed and it was a kind

of twilight, it became cool. "A great bunch of fire" swept by; then, as windows were opened, the air rushed violently out as though a vacuum had been created outside.

Some were saved, though with arms, legs and head scorched and flayed, while others inhaled the burning dust and died. Those who survive tell of the dreadful thirst that was upon them, a thirst they could not slake till they had staggered down the mountain to the safer settlements or till others had come to the rescue.

INFLUX OF HOT ASHES.

One man, who shut himself in with sixteen people, says that the ashes entered through a door that was partly open and killed six of the party on the spot.

Where this ash fell the rains have fallen, too, so that all the mountain is mud. It has put forth torrents of slime, and this morning its rivers are rising and the water is hot. There are hardly any bridges in St. Vincent, for the barefooted people do not mind fording the streams, and when some of our party undertook to explore the stricken country north of Georgetown they were driven back by these hot rivers. Had they crossed them, escape might have been cut off by the flood. Just at the sea verge there is a little vegetation, but it is withering fast. Goats and sheep are bleating piteously, for their forage is buried deep, and those that can are wandering to the lonely hills at the south, where things still grow. The ping and spank of rifles sounds in the wilderness.

"Who dat shootin'?" asks one citizen.

"I dunno who got de gun, but he ain't shoot no birds."

"No, dey ain't no birds, no mo'."

"He shootin' goats."

I roamed into the fields behind Georgetown last night. Soufriere was throwing out clouds that boiled upward in cushiony masses, their rolling edges taking pale light from the moon. The mountain's devastated slopes gleamed with moisture and one faintly descried the chimneys of sugar mills, marking buried industries. Along the edge of a ravine were twinkling a score of

fires, and dark figures flitted to and fro against them. These were the refugees, preparing supper. They are quartered in a school house and in a botanical experiment station near by, crowded in on beds, mattresses and on the floor, and cooking in the air; a throng of ragged men, half-dressed women and naked children, who had been chattering, scolding, squalling, gathering eagerly about the visitor to learn any fresh news of the volcano and to beg a penny.

Nearly every one of these people has lost a father, mother, brother, sister, wife, husband or child; some are bereaved of all their families and all their friends; yet there are few outward signs of grief. Nor can one say that the air is that of dull resignation. Rather it is a daze. They do not yet realize what has happened. They have passed through fire and the taste of air and sense of safety are still strange to them. Ignorant and slow of understanding they are, and they will emerge from these calamities like men in dreams.

It doubtless marks an undeveloped mind in the people of the islands that few, if any, have been made insane by the awfulness of their experience. Their sufferings are chiefly of the body, and these are endured with a cattle-like patience that is wonderful to a person made supersensitive by the refinements of northern life.

AN IMPROVISED HOSPITAL.

Step across to the tent hospitals and note the silence and resignation there. These tents have been pitched close to the sea, to get air and escape flies. Their sides are drawn up for free access of the breeze, and the cots are arranged with feet towards the central pole. All the patients are black, all the doctors white. There are young and old in the company, but no rich and poor. All are poor, abjectly, unconsciously poor, with a poverty that has never known a day of plenty.

To most of them this care and tenderness is a wonderful experience. The doctors go from one to another with a cheery, reassuring word and a smile that are worth more than medicine. As the cotton and bandages are snipped and peeled from the raw

flesh the patients wince and sometimes tremble with the pain, but there is not a word of complaint, not a sigh of weariness, not a groan, though some of them to-morrow will be carried from the place and lowered in the earth, out there where the grave digger is laying his line of double trenches, long lines, filled in at one end as he lengthens them at the other.

The injuries are not as serious as occur in a railroad accident, maybe; there are no crushed skulls and broken legs, no deep lacerations and big bruises, but they seem worse. The flesh has been scorched and baked, the skin has been peeled off in strips, ears have been nearly roasted from the heads, eyes have been half blinded, arms and legs are deeply swathed in cotton. A few relatives, a wife, a son, visit the tents and sit beside the sufferers, as still and as patient, and fan them, or pass water to them from time to time.

BODIES CREMATED.

The disaster on St. Vincent is more widely scattered than in Martinique. Most of the bodies that are not buried under ash and mud have been buried and cremated, though occasionally the odor from a deserted cabin shows the need of sanitary agents. A great epidemic has been foretold for the afflicted islands, but no tropical country ever before had so prompt and adequate a medical service to prevent it. The agency of flies, that made such mischief in the camp at Chickamauga must be taken into account.

On entering Georgetown last evening we encountered a throng of people gathered about the doors of a shabby shop, with pails, boxes and baskets. They were of all ages and both sexes, and they disclosed the same admirable patience that is shown in the hospitals. They were the applicants for relief. It is too early for any of the Dixie's supplies to be freighted over, but the local measures are presently effective. Only it is to be remembered the British methods are slow. Red tape is wound about everything, and the languor of the tropics, which does not stay appetites, will delay the means of ministering to them. Some of these people tell us that they have been waiting since morning and have been told to come again to-morrow.

American agents would have finished the business in one hour. The food which has been distributed is mostly bread, flour and salt fish. In the stricken district the people must rely for a time on stores. Not a cocoanut, banana or a mango remains on the trees. The root crops are buried, although in fields within four miles of the volcano a fresh output of green, tender and tentative, reveals the indestructible qualities of the arrow root. That, however, is an export, rather than a substance. All seek food, but, so nearly as I can discover, nobody is seeking work.

There is some thieving, yet not much, and considering that there are no soldiers on this island, and only a handful of police, the behavior of the populace and refugees is excellent—better than the behavior of an equal number of New York's citizens would be under the like circumstances. The negroes here in Georgetown have made no raids, but they have slipped into sugar factories and shops and in the past few nights have stolen thirty-four gallons of rum and sixteen hogsheads of sugar.

SINGING METHODIST HYMNS.

At 9 o'clock last evening three hundred of the refugees who are quartered in and about the supply house on the main street, were consoling themselves with Methodist hymns. Seated and standing in the windows and gathered on the rough pavement that has been drifted with the volcano's ash, they waited a leader. Some strong voice would begin "Jesus, Lover of My Soul," or "Nearer, My God to Thee," and in a moment all the others would be joined in harmony. The musical skill of these people is wonderful. There are no false chords or sharped or flatted intonations. Nobody has had singing lessons, or has heard anything about correct breathing, or method. All sing from the chest and the heart. The alto carried by some boys of nine or ten years, who do not know printed music from a prescription, is startlingly fine and true.

The moon was shining, the southern cross was sparkling in the sky, the surf droned along the beach, the camp-fires twinkled, the crickets chirped, the leaves of the banana tree rustled in the

breeze and the music added the one element to make this a perfect tropic night. And think what this comfort of song means to a people so bereft, so lorn, so terrified.

This morning the relief stations were besieged again, and the rations were handed out in the same hesitant fashion, with much reference to rules and regulations. The head of a family of five tells me that yesterday's allowance was four and one-half pounds of wheat, rice and fish, not quite a pound apiece for his people, and some who stood in the throng—they do not form the applicants into line—all day, got nothing at all.

TROUBLES IN FOOD DISTRIBUTION.

That care is necessary, however, was proved by the engineer who tooled our team of mules from Kingstown yesterday. This worthy, who has, through some mistaken charity, acquired what is known as a jag, related with perfect frankness that he had given his dinner yesterday to a friend, yet when he went to the relief station and demanded food they refused to give it to him, because he had a regular job. And he required to know what kind of a way to do business that was. We thought it a very good way, and that puzzled and surprised him, too. There are moral obstacles in this food distribution that the Yankees are happy to shrink.

What is called the Carib country, on the east side of St. Vincent, has suffered most. The ash-falls have been deeper and the mountain has freer vent on that side. Yet fewer of the Caribs have been killed and hurt than of the negroes among the plantations. These Caribs are the Indians, the aborigines, who have succeeded thus far in maintaining a tribal entity. Probably not many of them are of pure blood, yet they have the faces of Indians, their gravity of demeanor, their silence, and you may pick them out in any dusky throng by the clearness of their eyes and the straightness of their hair. Many have taken refuge in Kingstown.

It is claimed that before the eruption of Soufriere two hundred of them dug caves into the hillsides and were safely under cover when things began to happen. They are making no

complaints, and as soon as the mountain is quiet again they will probably go back to their fishing and basket making. More fright was shown here in Georgetown than among the Indians. When stones began pattering on the roofs—good big stones they are, too—there was a rush for cover. So many crowded into the carpenter shop, where the industry now is coffins, that not another person could enter, and those who were hammering for help outside were urged to distribute themselves in houses.

SPLENDID ELECTRIC STORM.

All who could crawled under the beds and tables. The air was hot and stifling with dust, and Dry River suddenly swelled from a trickle of water to a torrent 300 feet deep among the hill gorges. For a few days before there had been rumblings, and water in kettles and tubs turned white. On the 18th, the night before Pelée's strongest output, dust fell here, there was a splendid show of lightning, and though a terrific thunder-storm appeared to be raging overhead, the rainfall was almost nothing. Dust and scoria came down.

At four o'clock this morning we had an earthquake, and a tremendous tropical downpour. They told me all about it when I went to breakfast. I had about resigned hope of hearing the volcanic noises of which we read, but at 1 or 2 o'clock, while jogging dismally back to Kingstown, through a driving, soaking rain that drenched us to the skin, Soufriere began to grumble. The noise was somewhat like thunder, but shorter, more interrupted. It suggested the bumping of freight cars. Several times the sound was repeated.

Our driver became excited. He shouted to the people he met to go back, or not to go far, for "de mountain is bad again." And he larrupped his mules without mercy, turning around now and then to reassure us: "I'll get you into Kingstown, Marster. I'll surely get you in by 5 o'clock, 'cause I'm jess as scared as you are."

This driver, by the by, is the only frightened person we have seen—that is, alarmed as by an immediate danger. The others

are timid or disquieted, but active fright is too strong an emotion to ascribe to them.

None of us Yankees have been conscious at any time of peril. The tragedies seem to be in the past, and a mountain a mile or two away seems as distant as if it were a hundred, so far as there is any possibility of its doing injury. Yet, it was a terrible eruption in Soufriere, and at any instant it may be repeated. It has devastated the northern end of St. Vincent, just as the explosions of Pelée ruined the north extremity of Martinique. It has made changes in the geography, building hills, channeling hollows, altering the coast line, deepening the soil, utterly destroying life about it, and ruining all the villages and estates north of Georgetown.

The activity of the mountain to-day that to us was merely a distant cannonading in the clouds, was better seen by a boat party from the Dixie that went up on the leeward side of the island. Though shrouded in mist, the spurting and fizzing of a thousand steam vents could be seen on its slopes, and dust as well as vapor was bursting, from minor craters that are breaking like huge bubbles, in the mud banks. The roaring and booming were constant.

Kingstown, being the remotest place from La Soufriere, is the objective point of the emigrants. Government is helping the people to remove to places of safety, the freight steamer Wear bringing over a hundred a day from Georgetown, and taking relief supplies on the up journey. Two thousand people have left the Carib country, some settling about Barrouaille, only six miles from the volcano on the lee side, where the destruction has been most complete; a few at Chateau Belair, at the mountains' very foot, but more seeking the south end of the island.

SUPPLIES GIVEN TWICE ON EACH DAY.

The authorities have constructed 500 huts at Questelles, four miles north. These are wooden houses with roofs of corrugated iron and in apportioning them among the fugitives the Caribs have first choice. But for the dearth of wood, these cabins would

have been built before, but while vegetation is luxuriant enough in the tropics there is a lack of trees that can be used for timber. At present the runaways are quartered in and about a commissariat on the hills and in the old military hospital on the outskirts of the town.

They assemble twice a day for supplies and are supposed to receive enough for three meals. Ship's biscuit, rice and sugar are the rations and there is milk for the children, doubtless from local herds. In the commissary buildings the women and infants occupy the top story and the men sleep on the floor below. They are as comfortable as they were in the poor little shanties they call their homes.

When the Wear puts in at one of the shore villages to land supplies, her appearance is greeted with clamorous joy. Catamarans skim out and gyrate about her, and those who have no boats rush down to the beaches and dance about, waving their arms and shouting. On the arrival of a boat at one of these settlements with salt fish, hard bread and rice the "head man," a functionary who may be regarded as a mayor, but whose office is probably a survival of the Indian chieftaincy, takes charge of the supplies and to him the distribution is intrusted.

NO SIGNS OF STARVATION.

Have I seen great evidences of hunger? Frankly, no. Food is needed and will be till the people can get work and the fields can be tilled again, the richer for the fertilizing ash fall. But the black people of all the Leeward Islands from Dominica south, and the Windward Islands, too, for the matter of that, are every whit as meagre and ragged and beg as persistently as those of the stricken district.

Remember, the West Indian does not exhaust vitality as the American will do. He cannot even if he would. Fast, hard work in the blazing sun is not possible, and he is accustomed to a simple diet. If he has bread, he fares luxuriously. In the towns here you find peddlers vending little loaves as our peddlers sell cake and candy. The farm laborers live on manioc and molasses,

bananas, cocoanuts, yams, bread fruit and a little rice. Owners of farms add to this dietary a little milk and a holiday pig, the meat of a runt of a razorback, that even by Florida standards is insignificant. The mass of the people do not taste meat from year to year, yet, do you know, the clamor of the refugees is for pork. That is because they think they may get it.

PROFESSOR HEILPRIN'S GREAT FEAT.

The National Geographical Society has scored a great triumph through it representative, Professor Angelo Heilprin, who, with three guides, ascended to the top of the crater on Mont Pelée. Professor Heilprin is also president of the Philadelphia Geographical Society. Professor Heilprin had gone to the Plantation Vive, which is near the crater, in company with Fernand Clerc and Mr. Reid, landed proprietors of Martinique. This expedition was especially organized by United States Consul Ayme and Professor Heilprin and was led by the latter.

The expedition left Fort-de-France May 29, at noon. Friday the next day, was spent in studying the newly-formed craters on the north flank of the mountain. Saturday morning Professor Heilprin determined to attempt the ascent to the top of the crater, and with this purpose in view, he set out at 5 o'clock.

The volcano was very active, but amid a thousand dangers Professor Heilprin reached the summit and looked down into the huge crater. Here he spent some time in taking careful observations. He saw a huge cinder cone in the centre of the crater. The opening of the crater itself is a vast crevice 500 feet long and 150 feet wide.

While Professor Heilprin was on the summit of the volcano, several violent explosions of steam and cinder laden vapor took place, and again and again his life was in danger. Ashes fell about him in such quantities at times, as to completely obscure his vision. One particularly violent explosion of mud covered the Professor from head to foot with the hideous viscid and semi-solid matter. He still persisted in his study and observations, however, and twice more was showered with mud. He learned,

as had been suspected, that there were three separate vents through which steam issued. Full details of the Professor's observations cannot be had until he returns to Fort-de-France.

Professor Heilprin's journey down the side of the mountain was fully as perilous as the ascent. Mont Pelée seemed to resent the intrusion of a puny human being into her most awful precincts, and belched out huge volumes of steam, ashes and boiling hot mud.

SYNCHRONOUS ERUPTIONS.

The Professor made the important discovery that the crater at the head of the river Fallaise has synchronous eruptions with the crater at the summit of the volcano, and that it ejects precisely the same matter at such times. The river Fallaise crater and the crater at the summit showed during Professor Heilprin's visit a new poenomenon. Mud was thrown up in high columns. Heretofore the mud was bubbled or boiled out and flowed downward in huge streams. In the course of one eruption of the river Fallaise crater an enormous mass of intensely hot mud was ejected. This flow reached the rum distillery on the Vive plantation and extinguished all the fires there. This torrent of mud may invade the entire plantation, and as Vive is the centre of one of the richest districts of the island, it is feared the damage may be great.

Mr. Clerc furnishes the following further details of Professor Heilprin's ascent. The party proceeded on mules to an altitude of 700 metres, the ancient line of vegetation. From this point Professor Heilprin continued on foot, leaving the mule that had carried him up the steep hog back to the tree line. Upon reaching the site of Lake Palmiste the Professor found it completely dried up. He crossed the bed of the lake and continued on up the gently rising slope to the crater. Formerly the edge of the crater was a high bluff or shoulder. This, the explorer found, had fallen into the great crater, and he thinks this change probably occurred at the time of the great explosion of May 20. This is the first important topographic alteration in Mont Pelée which has been noted and verifie

Professor Heilprin arrived at the edge of the summit crater at half-past one, and remained there for over two hours. When he returned to Vive he resembled a statue of mud. The weight of ashes and mud he carried on his person, the horrible atmosphere he breathed and the fearful difficulties he encountered reduced him to a condition of extreme fatigue, notwithstanding the fact that he ascended Mont Pelée from the most accessible and easiest side. Professor Heilprin may return to Fort-de-France to-morrow, if he has sufficiently recovered by that time to do so.

George Kennan and his party, who went to Morne Rouge, found on their return trip, that a bridge across the road had been carried away by a torrent of hot mud. Negroes managed to get the party across the obstruction. They took the carriages to pieces and carried them and the members of the party to the other side of the river of mud, which was still hot.

Science has begun a systematic and persistent assault upon the batteries of the West Indian volcanoes. Helpless to check their detructive discharges, she has, none the less, sent hither the wise men from our schools, armed with exact methods and with delicate instruments, and they have assumed the task of observing and recording whatever may be gathered for the stock of human knowledge.

A SINGULAR PHENOMENON.

Among these eminent scientists is Professor T. A. Jaggar, of Harvard University. "To my mind," he said, "the most interesting point about the Pelée eruption is the fact that the matter, thrown out of the volcano in a vertical direction, afterward took a horizontal shoot, and, while it is too early yet to attempt a definite explanation of this singular phenomenon, I am inclined to believe that the matter was thrown to a very great height, and, following the law of gravitation, descended with great velocity—a velocity comparable, perhaps, with the swiftness of its ascension, especially as it neared the crater again.

"Here it encountered the matter in ascension, and was, accordingly, deflected in a horizontal direction. This action was like a

blowpipe effect, and shot the flame in the direction of St. Pierre and the vessels lying in the roadstead. The intense heat from the blowpipe cut a patch through a certain section only, for there is a very well defined line of demarcation between the living vegetable matter and the ashen path.

"As far as I could observe, as we passed along the coast, no large stones nor solid matter of any kind were thrown out of Pelée. It may be that there are some very small fragments of solid rock lying under the heaps of ashes with which the streets of St. Pierre are heaped, but we will not know the exact nature of the matter ejected until a critical examination of the ground and the ejected material is submitted to careful analysis.

"I am inclined to believe that the matter belched forth was almost altogether pulverized rock or the earthy and mineral matter of which those mountains and the bowels of Pelée are composed. This matter, when blown to dust by the terrific explosive forces, resembles ashes, or 'Portland cement,' and when mixed with steam and wet by the rains appears as gray mud.

"As to the character of the gas that is believed to have accompanied the ejected matter, I am not prepared to express a definite opinion until I have made careful analysis. It may have been carbon dioxide, that consumed all other carbonaceous matter in its path, or some other gas, or it may have been merely the intensely hot steam. The union of oxygen and hydrogen and other elements may have produced the instantly disastrous effects that some attribute to asphyxiation by gas."

FURTHER ERUPTIONS IMMINENT.

I asked Professor Jaggar whether, in his opinion, there was any danger of further eruptions. He replied: "Considering the fact that there have been several recurrent eruptions of both Pelée and Soufriere, and in view of the further fact that the one of May 20, at Pelée, was of even greater severity than that of May 8, it may naturally be expected that there will be further convulsions.

"Then again, the fact that the eruption at Soufriere, St. Vincent, occurred on May 7, and at Pelée on May 8, tends to show

some sort of relationship or sympathy existing between the two. I am inclined to believe that they are on the same fissure.

This theory is further strengthened by the fact that the commander of the garrison at St. Lucia (lying midway between the two volcanoes) in using his range finder observed bubbles in the sea on a line between Soufriere and Pelée. They were, I believe, omitted from the submarine fissure, which becomes the subterranean fissures of Pelée and La Soufriere. Until there was what we call an 'adjustment' or 'compensation' between the elements along this line, there will be recurrnt explosions or eruptions of more or less severity. If there had been scientific data at hand, the people of Martinique and St. Vincent would have been forewarned, for, as in 1812, local earthquakes were felt around La Soufriere for about twelve months preceding the eruption of May 7.

We made another visit to St. Pierre and found that Mont Pelée was in a complacent humor. Its head was shrouded in cloud, and a few sofatari were puffing along its sides, but there were no unholy exhibitions of strength or spite, and no thunder or shakes. The sun shone into the broken streets with such vehemence that two of the pilgrims were overcome and had to be soaked about the head with water. It was blazing weather, almost as fierce as that of New York in August, but not quite—seriously, not quite.

BURNING THE BODIES.

And what a scene of desolation this sunlight falls upon! It was stern in the blackness of yesterday's eruption, but the white glare to-day lights new woes into being. Humanity stirs among the ruins again. A dredge came from Fort-de-France this morning, with a few soldiers, as guards, and seventy-five or eighty negro laborers. They will not try to clear the streets. They will open a few safes to recover treasure, but chiefly they will burn the bodies that still lie under the tumbled walls and are half buried in the ash. There has been a rainfall over night, and where the dust kicked into the clouds about us yesterday, to-day

we plunge about in mud, the finest, the slimiest, most clinging mud you can imagine.

Everything reeks in it. A faint and faded stench of sulphur rises, as we slosh about, tripping against sunken rocks, and one man slips on the edge of a retaining wall and tumbles into a yard fourteen feet below, to the sorrow of his shins.

I don't know how it is that we make light of these matters, or pretend to, as we slip and founder through the mire, but deaths we do not see will seldom haunt us, and some unfortunates who step into corruption that was alive the other day, feel disgust and nausea rather than horror.

It has been given out that an overwhelming evidence of decay is issuing from this spot. It is not so. At two miles off shore I notice it, yet when traveling over the ground it is at least partially submerged under a smell of burned material—the smell of scorched wood, paper, cloth, rugs, food, a general indescribable, foul and pungent odor.

NAUSEATING STENCHES.

Still, one locates cadavers easily by the nose, and a few are made sick by them. You pass to the leeward of a corpse and the proof of death is so persistent that you look in that direction. You see nothing, perchance, among the heaps of fallen masonry, the prostrate trunks of palms, the iron fences and the rubbish of old tinware, covered as they are with gray, but if you have been among the like before you will know the signs.

The human body, even of a lean West Indian, contains a considerable amount of oil. This oil has tried out in the torrid climate and soaked upward through the ash, so that you find the figure stretched upon the earth in brown. Wind has blown the ash from some of the forms, so that the faces are plainly distinguishable while in other cases the corpse is merely suggested to the eye.

In the cemetery I found one man whose position, excepting a slight lifting of the hands, was that of rest—the attitude of one who has thrown himself upon a grassy bank to sleep, the head

thrown back, the arms extended, the legs apart. At a little distance was another lying face down. In the debouch of a narrow street was one that was half skeleton already, the bones showing yellow white through the cooked flesh, and green and shining flies crawling over the head.

CALM APPEARANCE ON A MUMMY FACE.

Atop of a retaining wall, closing a yard that is eight or ten feet below the level of the impending terrace, lies a man with head hanging backward over the edge, and arms dangling over the stone work, too. The form is that of an Egyptian mummy, dried and blackened, but the expression does not denote fear and pain, such as a few of the visitors allege they discovered on the faces of these dead. Those I have seen denote calm. The visitations of dust for some days preceding must have persuaded those who were watching the mountain that this was to be only a passing fall. It was not the dust that killed; it was gas, sulphuretted hydrogen possibly, and it made all who breathed it unconscious at the first inhalation. It was a merciful death.

Those lying beneath the wreckage were not killed by blows of falling stones and timbers. They had passed all feeling. The supposed keeper of the cemetery with his keys fell where he stood. One figure crouched beneath a gravestone as if he feared what was coming, yet his collapse in that position may have been an accident. In front of a house containing thirty bodies is a carriage, recognized as that of a rich merchant who left his fine estate among the hills on the night before and came here for safety. He is dust. His beautiful place on the heights remains. The body of a girl in one house has fallen easily before her piano, as if she were at practice that morning.

Often in walking over fallen walls I was conscious of bodies beneath, the stench rising through interstices in the stony mass. Some of the bodies were mere fragments, but that may have been because they were imperfectly burned. The methods of the laborers here are superficial. They do not search deep for the corpses, but when they find one they scrape together a few planks,

shingles or shelves from the wreckage, lay them on the cadaver and set fire to it. Complete incineration is impossible in such a case, but it probably dries the body and reduces the danger of contagion that is expected when the air clears enough to induce the flies to return in numbers.

GROTESQUE SCENES.

The negro workmen are mortally slow. They dawdle and talk, accomplishing less in a day than American laborers would do in an hour, though it must be said in their behalf that they have to contend, not only against the severities of sun heat but with the sting of the fire and the noisome exhalations from roasting carrion. Grotesque rather than terrible are the bodies as they peep from the timbers and the flames.

Although the gas which destroyed this population, the heat of the houses as they burned afterward, the heat, too, of the falling ash, which was like needle points of fire, scorched the bodies indoors and out, a few were partially preserved. One of the corpses that I found near the little park was first seen because of a foot protruding through the mud, and the bottom of this foot showed a skin typical of the negro.

An early visitor to the scene of the disaster on opening the door of a bedroom found a woman and three children. The woman had fallen back on the rude couch that was her bed. Her pipe had slipped from her mouth and lodged against her breast. On a box at the head of the couch was a bowl of gruel and a fragment of bread. The children were lying, one upon the other, on the floor, and of this whole company it was only the child nearest to the door that had been scorched. Even the woman's single garment was not burned.

One of the most curious finds was that of a reporter in our party. He went into a bakehouse containing two arched ovens. One of these ovens was empty. In the other was a man lying in an easy attitude on his back, feet at the door, arms extended and knees slightly bent. What possessed him to hide in the oven? In the tropics one seeks coolness, so he could not have gone there

for sleep. He must have been terrified by the darkness, the oncoming dust, the hail of stones, but the sulphurous blast sought him even in that refuge.

At this stage identification of bodies, save by doubtful accessories of rings, watches and the like, is impossible. All the bodies are blackened by fire, and most are half buried in ash. Those lying beneath the stone heaps will not be reached in years, at the present rate of progress of the native laborers, and we may be sure that when they are uncovered, practically nothing will be left of them.

Buildings and environment predicate nothing of their contents. For instance, I found what was apparently a hospital or nursery, with iron bedsteads, close set together with evident fitness for use. These beds were half buried under foundation stones and sections of wall.

Yet here I detected not a whiff of carrion odor. Where were the inmates of the place when the fire fell? Ah, true, they may have been nuns, and may have been at prayers in the cathedral, at the fire fall. Nowhere did I see any token of concerted action; no crowd in a street, struggling toward the sea; no company arrested in flight on the roads above the town; no people huddling in corners, as if to get as far as possible from the fire. The corpses do not lie in the positions of people who had turned from danger. They are in every attitude, and face as often toward Mont Pelée as away from it. Their clothing is burned off. Sex is seldom distinguishable. Death was mercifully swift.

FER DE LANCE IS EXTERMINATED.

There is more for the burners than to cremate these human remains. There are domestic animals that equally threaten health. In one stable can be counted half a dozen horses lying in the mud. One man was in the act of mounting his horse in a street when death came to both. Of dogs and cats and fowls, there is no telling how many are in the ruins. And in all this holocaust there is but one consolation: the dreaded fer-de-lance, or trigonocephalus, the most poisonous of ser-

pents has been exterminated for miles around Mont Pelé and will not go back again till its mud hills have cooled and its streams have ceased to boil. It still abounds, however, in the jungles of the interior, and its obliteration from St. Pierre is a small advantage, because in the same region human life is impossible, too.

Death here is grim enough, Heaven knows, yet in comparison with the reach of the devastation, single human creatures are small. The corpses are incidents. The destruction of a city that was an upbuilding of years of toil and a culmination of schemes of art and commerce, is more impressive and even sadder than those poor wrecks of flesh and bone deliquescing among the ashes.

The visual sign of ruin is so great that there is no comparison for it. One thinks of the burned districts of great cities, yet even here the likeness does not hold. In a burned district walls and chimneys will still be standing, a few windows will be intact, some streets will be clear, but in St. Pierre architecture does not exist; it is a place of foundations and rubbish, with not one pane of glass for miles. There is not a yard of clear street. It is as if a blast of dynamite had shaken the town asunder. Streets and lanes lead nowhere, and the pathos is heightened by the names and numbers, stamped on metal in blue enamel—futile guides, read only by ghosts.

RAVAGES OF DEATH.

To stand in one of the streets, like the Rue Victor Hugo, formerly lined with attractive shops and gay with color, and see it now, with skeletons of houses on either side, the windows staring like sightless eyes, the doors gaping like suffocated mouths, the pavement heaped with stones, to note the fixity and silence, is to stand in the presence of death—death enthroned in fire and cloud, wielding thunders and breathing poison. The world has no other spectacle like that in Martinique to-day.

So complete is the destruction that little remains to mark the character of the buildings. The parallelogram of masonry, scarred, blackened, dust-covered, might be a house, a stable, a shop,

a factory, a church, a jail. Now and again there is a yard or court, with flower pots or a fountain that denotes a former home of the moneyed resident, but which was his house, which his office, which his carriage shed, which his servants' quarters, is mere guess.

And this wide throw down of walls and blocking of streets makes it hard to estimate the size of the city. There is no doubt that the first reports of the fatality were exaggerated. They put the loss of life at 40,000. So near as one may learn from the imperfect methods and imperfect records, the population of St. Pierre was 26,000, and the outlying villages which were destroyed at the same time added but a few hundreds.

BATHER'S BODY FOUND IN THE BATH.

Few things among the ruins assures one better of the social status of St. Pierre than the baths. The Latin is not a persistent bather and in hot lands the people dip for coolness rather than cleanliness, yet here were marble basins where the man of leisure could not merely dabble but swim. One such is twenty feet long and fully eight feet deep. It was fed from mountain springs that probably ran hot and sulphurous on the 8th. A body was found in one of these pools the other day. Had the bather gone into the water for coolness, or was he swimming when the suffocating gas enveloped the city?

Nor were the pools the only token of an advanced and decent form of living. The household ornaments though many of them are cheap and provincial, tawdy in color and flimsy in substance, are occasionally of a fineness and delicacy that bespeak the Gallic taste. Probably not a picture is left in the city to denote the popular likings, but crucifixes, lamps, bronzes, silver, and other such belongings are deftly wrought and beautiful. The altar of the cathedral must have been resplendent with its carved marbles, its brazen lamps and candelabra and its golden communion service.

To the Yankee there is an assurance of ante-mortem industry on the part of St. Pierre that raises its people in his estimation and comforts his commercial instincts. This he finds in the abundance of American sewing machines that are found inside the houses.

A common form of the sewing machine in the poor towns of the tropics is that used by sailors, who sit on the deck and run the wheel by hand instead of by the foot, but these of St. Pierre are high grade, with all modern improvements.

American bedsteads and machinery and probably American food stuffs were exported to Martinique, and there were a few pianos. What sounds arose from the jangling strings when the city fell? Human ears did not hear them; the hands that had touched the keys were still, but the last voice of the dying city was a voice of music; the cry of the pianos and the hum of the cathedral bells under the pounding of the stones.

THE CITY HAD WARNING.

The world knows the history of this last eruption, in the main, but its details it will never know. This much, however, is certain: St. Pierre had warning. So did Pompeii. A trust in the harmlessness of the adjacent volcano caused the fatality in each instance. The Governor of Martinique advised his people to remain at home. He believed in his own advice, for he was a victim to it. For more than fifty years Mont Pelée has been quiescent, save for a little harmless growling in 1871, and no man dreamed of the fate that was in store for this city of St. Pierre. People went about their work, the band played under the palms in the park, the planters hoed their cane, carts rumbled down to the sugar mills as if the cloud on Pelée meant no more than a shower.

"Les Colonies," a little newspaper of the town, files of which are preserved at Fort-de-France, and are in possession of Chaplain McGrail, of the Dixie, contains some history that should have been construed as warnings. An issue of May 6 says that at five o'clock on the previous morning "torrents of smoke were escaping from the Terre Fondue." (Volcanic dust is nearly always called smoke.) The Riviere Blanche, flowing down a hollow of Pelée and emptying close to the city, "periodically swelled and supplied a volume of water five times greater than normal." It was bringing blocks of stone weighing fifty tons. A certain M. Landes went, just after noon, to L'Etang Sec (dry pool), on the

mountain side, and saw a whitish mass come down with the speed of an express train.

This was a flow of mud, giving off a "thick, white smoke." It submerged and destroyed the sugar mill at the north end of the town, known as the Factory Guerin. Later M. Landes reported a new branch at the bottom of Morne Lenard, which supplied the "lava." (There was no lava; only mud.) The factory, he thought, had been destroyed by a landslide, rather than a flow, though "muddy lavas" develop rapidly. The valley, he believed, had received the contents of the hollow known as L'Etang Sec. No earthquake was noted, for he believed the ocean acted in some way as a stop to the activity of the mountain. Meantime, the central peak of the volcano was taking on a threatening aspect. It was throwing up black and yellow matter that crumbled into dust on exposure to the air.

WARNING IN THE DAY'S NEWS.

And this significant conclusion is offered: "It is necessary to fly from the valleys and live at a height, to avoid being submerged by the mud. Vesuvius has had only rare victims. Pompeii was emptied in time. Mont Pelée offers no more danger to St. Pierre than Vesuvius to Naples. But this morning the mountain was uncovered, and Morne Lacroix appeared with an opening one hundred metres long and forty meters high." And here is a paragraph in the last newspaper printed in St. Pierre. "We shall not publish to-morrow, the 8th, that being the Feast of the Ascension and a holiday." Significant assurance! "Les Colonies" will never appear again.

An excursion to Mont Pelée was fixed for the Sunday before the tragedy. It was advertised in St. Pierre. A local club of hunters and gymnasts took the lead in this, and tickets were issued at three francs each. It appears uncertain whether this picnic was attempted, for there had been a good deal of threatening on the part of Pelée for days before that time.

On the 25th of April a guide, Gulien Roman, of Morne Pahillot, made a trip to Morne Lacroix, the peak of the volcano,

"a vast area, with a hollow of six hektares, on one side of which opens the crater, a great syrup kettle of rectangular shape, thirty meters long, twenty meters wide, filled with bituminous matter, which puffed up, allowing the escape of vapor and hot water. L'Etang Sec is now a reservoir which receives the waters that spurt from the crater."

BELIEVE THEY ARE DOOMED.

A later account continues: "Since this ascent we have been getting ashes. No guide has been there since. What has to-morrow for us? Will there be a flow of lava, a rain of stones, jets of asphyxiating gas—what submerging cataclysm?—or shall we have a flood of mud? When the secret is known, many men will not be able to keep it." This remarkable utterance was made on May 5.

On the night of May 3 a considerable panic occurred among the congregation in the cathedral, and a dust fall came from the mountain, so blinding that a traveler barely escaped falling into the Riviere Blanche.

An excursionist who went as far as the foot hills reported ashes on the road 15 centimeters deep, "giving one the illusion of walking delightfully through the gray flour of America, but, unfortunately, this dust rises in whirlwinds at the least breeze and you must tie a handkerchief over your face. Vegetation is covered with this gray snow. In the country there is desolation, dryness and silence. Birds lie smothered under the bushes, and in the fields the restless cattle snort and roar."

A paper of May 5 says: "On Saturday evening, toward 6.30, the excursionists from Fort-de-France tried to approach Precheur, to see the phenomena. The coast was so obscured by steam and cinders that they put back to sea. Some returned by land, afoot and horseback. From 3 P. M. there had been no communication between St. Pierre and Precheur. Toward 7 P. M. the cinder rain began again."

On Sunday and Monday evening the electric lights went out and the people were disquieted. Editorial comment was calming,

however, as the failure of the lights was ascribed to atmospheric conditions.

Fort-de-France was as badly frightened as was St. Pierre. "The people (of the Fort) believe they are doomed. Not half of the regular population remains. The top of Pelée has not been blown off, and that makes us fear there is not vent enough."

The activities of the 5th of May are summarized in this manner: "The eruption seems to enter a calmer state. Cinders continue to fall on Precheur and other leeward towns. The fall of ash in St. Pierre increases its depth to four millimeters. On Precheur are five centimeters. On the middle of the mountain the depth is a foot. Country places are abandoned for lack of food and water, and trees are breaking under the weight of cinders.

"On the night of the 4th there were lightning, thunder and tongues of fire. The latest news is that the Riviere Blanche is overflowing and threatening the destruction of the Guerin factory. M. Guerin is going from St. Pierre with his family. Latest: At noon the sea withdrew 600 meters from the bank, and rushed back. The people are in a state of madness. Thousands run toward the coast. Children are crying, women lamenting, shops are closing. The wind is strong from the southwest. The Guerin factory has been swept by the sea and destroyed."

FATE DOOMED THE GUERIN FAMILY.

On the next day, the 6th, the opinion is expressed that the inrush of the sea was not due to volcanic action, but to the landslide—the fall of a mass of earth and lava. For days the Riviere Blanche has been running dark and swift. At 2 o'clock on Sunday morning it was a torrent. M. Eugene Guerin was sad and a little nervous. They begged him to leave the place, but he refused, breakfasting quietly with his wife and father. His yacht was ready to sail for Fort-de-France. Work at the Guerin factory has been suspended from the evening of May 2nd because of the cinders. On the afternoon of May 5th a mass of boiling water gushed from the mountain in great bounds, poured down the

mountain, and ingulfed the Guerin household, also causing the Carbet—the Guerin yacht—and the Precheur to founder.

After this the water, laden with mineral matter and whirling rocks along in its current, leveled a considerable stretch of country, forming a plain of mud from Isnard to the sea. This plain is many hundred meters broad and fifty meters thick. People began to flee the district. The Guerins would have found refuge in their yacht had not the father remained to give an order. He alone of the family was saved. The factory and its surroundings disappeared in the mud, all except the iron chimney and its four guy wires, and four iron lighters, one of which, with its load, turned a complete somersault. The sugar scales projected from the water. One workman escaped by hiding behind a parapet. It is known that twenty-four others were killed.

Even this warning does not seem to have produced a great effect in St. Pierre, and instead of advising the people to fly the town the local editor says this: "Shall we have an earthquake? Not probable. The crystals filling the air make sore eyes and irritate the throat, so the people, especially the children, should stay indoors."

When the city was destroyed its people were taking up a collection for the families of those who had perished in the Guerin factory. Impossible that the charities of the world would next day be asked for Martinique!

MONT PELEE STANDS IN GLOOMY GRANDEUR.

What is this new world Vesuvius that has repeated the deadly miracle of more than eighteen hundred years ago? Mont Pelée, the tallest of the mountains on the mountainous island of Martinique, is, or was, 4,400 feet in height. Reports that the explosion had blown away 1,500 feet of its altitude are wrong. The concealment of the top by clouds until last evening made any sort of guessing possible, but Mont Pelée has lost little or nothing of elevation. When the eruptions simmer down and the ash emerges gently, the cone will be rebuilt by these falls and some hundreds of feet may in time be added to the crater's rim.

Our geographies used to describe a volcano as a mountain belching fire, smoke, and melted lava. Except that it need not be a mountain, does not emit fire, does not smoke and does not of necessity throw lava, this definition is right. A volcano is a vent for the subterranean heat; therefore it is, first of all, a hole in the ground. The building of a cone of ash and cinders about the hole is a mere accident. No fire issues from the earth, because there is no fire to issue. The earth's interior, if not wholly molten, contains at least large spaces or cavities filled with the rock in the condition of iron as it runs from a foundry cupola. It is not on fire; it has never cooled.

Some geologists deny this. They regard the planet as practically solid to the center, and attribute earthquakes and eruptions to the slipping of faulted rock beds, to chemical action, even to magnetic disturbances; anything but the easy thing. A molten mass beneath a cooling crust explains it all. A crack in the earth, a submarine landslide, like that which lowered the floor of the Caribbean over 2,000 feet a few days ago, will let in vast quantities of sea water against the hot rock. Steam will be generated. Steam will seek exit in some fashion.

EXPLANATION OF THE PHENOMENA.

The volcanoes are safety valves. It seeks the air through them. That in this process of eruption quantities of the rock lining the chimney will be cast out with the steam is certain. If the ocean water falls to a great depth, it will bring lava with it. Even the rock masses borne to the surface will generate friction, and will be heated against the volcano's throat. And, again, lava may be forced out by a local collapse of the earth's crust. But of fire there is none, except what is due to a momentary explosion of gases. The glow of a crater on the under side of the dust clouds, which are commonly called smoke, gives an impression of it, to be sure, and the ejection of red hot stones will look like streaks of flame at a distance. Then there is lightning, which is usually to be seen playing above a crater in time of eruption, and may be supposed to be an emergence from the crater itself. This light-

ning is an electrical exchange between the hot and humid clouds originating in the volcano and those passing in a cooler stratum of air.

On our first sight of Pelée, as the Dixie sailed by at 4 o'clock in the morning, the mountain's top was buried in masses of vapor, from which issued bolts of lightning from time to time, and as day broke we saw the so-called smoke column lifting into the forms of cumuli, or thunder heads, a layer of brown ash streaking the lower part of the cloud.

NO OUTPOUR OF LAVA.

In these West Indian eruptions, of Pelée and Soufriere, there is no output of lava. The splinters of stone that are hurled for miles around the country, whenever one of these peaks blows off, are lava, if you like, but old lava, ripped from the crater's side and not a flow. No molten material has shown itself in Martinique or in St. Vincent. The devastating materials are ash and mud, and the mud is ash mixed with hot, sulphurous water. The outcast stones are gray, usually porous, small, light, with crystalline deposits in their cavities. A few solid materials have fallen, and there has been a little pumice—the froth of lava, so tenuous and filled with air cavities that it floats on water. Many pounds of it have drifted against the beaches of the Windward Islands since Pelée was in eruption.

We do not associate mud with sublimity, but the gloomy mass of Pelée has a Satanic grandeur. Every green thing has been burned and swept from its sides, and from its foot in the ocean to its top in the clouds, no living thing is seen. The seaward side of its crater has been blown out for a thousand feet, disclosing it as a funnel-shaped pit with steam pouring from a vent in the bottom.

Numerous small craters, fumaroles and solfatari, that change their places almost while you look at them, belch steam, sometimes, clear, silvery white, again a dirty yellow, and these vents extend down the mountain slope for miles.

The monster has been fearfully scarred in these late erup-

tions, and has poured out millions of yards of ash and slime. What was the Riviere Blanche is now a mass of mud, which has the form of a glacier and has stopped just at the walls of the northern part of St. Pierre, rising above them to a height of thirty feet or so, and doubtless burying detached houses in that quarter.

This mud forms a tract a mile wide and two miles long, and although its surface seems smooth, except for the channeling of rains it is really pierced by many vents, through which issues steam, either from the earth's depths, or liberated from the bottom of the mass itself. Immense gutters have been worn into the mountain by the flow of hot water—gutters that are really canyons, hundreds of feet in depth. Their color is a dark and slaty gray. The forms of hillocks and buttresses are much sharper than would be supposed, considering that they are mud, but the material has lain there for centuries and has solidified almost into rock. The cliffs that overhang St. Pierre and were the site of a famous botanic garden, are merely the edge of a mud flow, heavier than occurred in this last eruption.

CLOUD-CAPPED AND GLOOMY.

From the north end of the island the gradient to the summit is but 9 per cent.—a slow, steady ascent like a sea swell, but from St. Pierre the rise in some places is so steep as to make parts of it inaccessible. Nearly all of these West Indian peaks are cloud-capped for weeks together, but Pelée is especially obscure at present. When the clouds do lift or part for a moment there is seen a shattered pyramid, torn and twisted into a hundred lesser peaks, some vertical, one or two overhanging. Each successive eruption is blasting away its crater more and more on the seaward side, disclosing an amphitheater that would hold a town. Its heaved, rent flanks, now clear, now dim with sulphur vapors, show peculiar tints in the changing lights.

The tenderest silver gray of my lady's glove is its ground hue in the sun, and this likeness is the better suggested because of a velvety softness of surface. Ash terraces, resembling the giant stairs of the western Bad Lands, have been built up, and where

they take the light, they show a sulphurous whiteness, elusive, delicate as fresh snow, or grape bloom. In the midst of the recent mud stands, dark and castle-like, an old hill of eruptive material, a few hundred feet high, its sides draped with strings of stalactites of slime, and the new material solidifying about it like a frozen river.

NO TRUE LAVA SEEN NEAR MONT PELEE.

Whether you see Pelée as we saw it in early morning, with its vapor whitening in moon and starlight, then turning pink and orange in the dawn, as if the spirit of an opal were dwelling there, or you see it in the gloom of an eruption, it is strange and insubstantial no less than diabolic—a chaos of wild forms—a something aside from nature. Its steam does not usually issue in quick gusts, but raises heavily, sullenly, opening into great rolls of cloud, and as in the vents along the side, it changes color, showing now a dazzling white, anon a gray, then a dirty yellow or brown.

A pulse of energy is felt in the crater, and there rises, instead of steam, a dark and curling column of dust. There has just descended a stream, perhaps two miles long, of what is locally called lava, but is a black, bituminous-looking mud, mantled with steam. A new chasm, a thousand feet in depth, has also broken on the seaward side, and on the northwest face is a vast series of rounded deposits, like Tartar tents, but the slime as it dries oftener collapses into roof shapes and Alpine outlines, which in time will sink and flatten.

The whole north end of Martinique, a third of the island, has been covered with dust that gives to the forest the whitish look of our woods on a November morning when frost has formed. It is pallid, deathly and under blight.

What surprises us is that the eruptions are subtle and silent. We have felt no earthquake, have seen no agitation of the sea, have heard no rumbling and roaring. The explosion of yesterday, that hurled stones to a distance of ten miles, was heard in Fort-de-France only as the cough of a dynamite gun.

Pelée is sublime in the energy it stands for. The columns of steam and dust which are brandished from the crater are such

destroying weapons that all human devices for injury are trifling in comparison. Its quiescence until a month ago made it safe for excursionists to scale it. There were no earthquakes before the overthrow of St. Pierre, as there were about Vesuvius before that mountain overwhelmed Herculaneum and Pompeii, although water flowing from it was warm last fall, steam vents appeared later, and noises were heard in April.

It is not merely the central chimney that is eruptive now, but minor ones that have broken out on its side. The fumaroles and solfatari that have burst out in a four mile belt undoubtedly relieve the pressure and reduce the danger from an overflow at the summit. The column of steam that is now writhing upward from the top is only a few hundred feet in thickness, but it is of wonderful dimension, as it widens over the surrounding sea and islands. In the great yet almost harmless outbreak of May 20, the steam and dust column ascended twenty-five miles into the air, spreading into the form of a pine tree, it is said, a form common to the output of Vesuvius in its active periods.

One of the curious allegements of that erruption is that it tossed out fragments of human bones, which fell in Fort-de-France, ten miles away, one or two of them coming to the deck of the Cincinnati in that port. It is most unusual conduct in bones to endure a drop of miles to a ship's deck. The bombardment of stones was more serious, yet, excepting the case of one soldier who was scratched on the temple, there were no casualties.

Professor Russell, of Michigan University, said that it would be futile at this time to attempt a scientific explanation of the cause of these eruptions. He considered them somewhat unique. Professor Russell is evidently of the opinion that there is a close sympathy between La Soufriere and Pelée, but would not attempt to explain why the ejected matter at Pelée was different from that thrown out by La Soufriere. The former was "ashes" or powdered rock, while La Soufriere threw out a sort of pumice stone or scoria. He says no man can safely predict whether these volcanoes will continue in eruption, or whether others in the vicinity will become active.

LIBRARY OF CONGRESS
0 015 822 702 2